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LGM-30B, STAGE II DISSECTED MOTORS TEST REPORT,(U)
JUL 80 D ANDERSON
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HEADQUARTERS
OGDEN AIR LOGISTICS CENTER
UNITED STATES AIR FORCE
HILL AIR FORCE BASE, UTAH 84056

LGM-30 B
STAGE II
DISSECTED
MOTORS
TEST REPORT

PROPELLANT ANALYSIS SECTION

MAKPH REPORT NR 443(80)

JULY 1980

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~~MMWRMBM~~ Project M14060C

LGM-30B, Stage II

DISSECTED MOTORS

TEST REPORT

Author

Daryl Anderson

DARYL ANDERSON, Chemist
Component & Combustion Test Unit

Engineering & Statistical Review By

Glenn S Porter

GLENN S. PORTER, Project Engineer
Service Engineering

Edward J Erickson

EDWARD J. ERICKSON, Statistician
Data Analysis Unit

Recommended Approval By

Leonidas A. Brown

LEONIDAS A. BROWN, Chief
Component & Combustion Test Unit

Ronald F. Larsen

RONALD F. LARSEN, Chief
Physical & Mechanical Test Unit

Approved By

Anthony J Inverso

ANTHONY J. INVERSO, Chief
Propellant Analysis Section

July 1980

Missiles, Airmunitions, & Weapons Division
Directorate of Maintenance
Ogden Air Logistics Center
United States Air Force
Hill Air Force Base, Utah 84056

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ABSTRACT

This report contains the data obtained from testing propellant and case bond materials from two dissected Minuteman Stage II motors. The tests conducted were in accordance with Service Engineering (MMWRME) General Test Directive GTD-1 Dissect dated 28 June 1974. The directive specifies the tests required to elucidate any age induced problems which may affect the service life of the Stage II motor.

Linear regression analysis was used to indicate trends of the test parameters. A representative regression plot was made of several parameters with each motor tested to date identified by different symbols. The regression analysis normally verified the trends established during the last test phase. Although there were a few trends which changed from significant to non-significant and a few that changed from non-significant to significant it does not seem likely that any problems of major concern are apparent at this time.

TABLE OF CONTENTS

TABLE OF CONTENTS (cont)

TABLE OF CONTENTS (cont)

TABLE OF CONTENTS (cont)

TABLE OF CONTENTS (cont)

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GLOSSARY OF SYMBOLS AND TERMS

Symbol	Definition
Crosshead Speed	The rate of travel of the crosshead which pulls on a tensile specimen. Dimensions: in/min
CSA	Cross-sectional Area. Dimensions: in^2
DSC	Differential Scanning Calorimetry
D(t)	Creep Compliance - ratio between strain and stress at a given time following application of a constant stress. Dimensions: in/in/psi
DTA	Differential Thermal Analysis
E	Young's Modulus - ratio between stress (acting to change length) and the strain produced by this stress. It is calculated from a portion of the curve where stress and strain are linearly related. Dimensions: lbs/in^2
EGL	Effective Gage Length. Dimensions: in
em	Tensile strain (fractional change in length) at maximum stress. Listed as EM in G085. Dimensions: in/in
er	Tensile strain at rupture. Listed as ER in G085. Dimensions: in/in
E(t)	Stress Relaxation Modulus - ratio between stress and strain at a given time following application of a constant strain. Dimensions: lbs/in^2
F	The ratio of the sum of the deviations from the regression line to $(S_E)^2$. This calculated value is compared with a table of critical values to determine whether or not the variation from the regression line is significant.
γ	Cohesive Tear Energy. Dimensions: lb/in

GLOSSARY OF SYMBOLS AND TERMS (CONT)

Symbol	Definition
JANNAF	Joint Army, Navy, NASA & Air Force Committee
MAKPH	Propellant Laboratory Section, Ogden ALC
N	Number of test specimens represented
Ogden ALC	Ogden Air Logistics Center, Air Force Logistics Command
Linear Regression	A line with the general equation $Y = a + bx$ which best represents the trend of the mean test values with respect to time.
R	Linear Correlation Coefficient. It is the slope of the regression line corrected by the standard deviation of x over the standard deviation of y. The calculated value of R is compared with a table of critical values to determine whether or not the correlation of the samples is significant.
Sm	Maximum tensile stress (normal force per unit cross-sectional area). Listed as SM in GO-85, Dimensions: psi
Sr	Tensile stress at rupture. Listed as SR in GO-85, Dimensions: psi
S_y	Standard deviation (square root of variance)
S_B	Standard error of estimate of the regression coefficient.
S_E	Standard deviation of the data about the regression line (also $S_{y.x}$).
Strain Rate	The crosshead speed divided by the EGL. Dimensions: in/in/min
t	The ratio of the slope of the regression line to S_B. The calculated value of t is compared with a table of critical values to determine whether or not the slope of the regression line is significant.

GLOSSARY OF SYMBOLS AND TERMS (CONT)

Symbol	Definition
TCLE	Thermal Coefficient of Linear Expansion. Dimensions: in/in/^{o}C
T_g	Glass Transition Temperature. Dimension: ^{o}C
TGA	Thermogravimetric Analysis
Variance	The sum of squares of deviations of the test results from the mean of the series after division by one less than the total number of test results.
3-Sigma Band	The area between the upper and lower 3-sigma limits. Presuming normal distribution, it can be expected that 99.73% of the inventory represented by the test samples would fall within this range.
90-90 Band	Assuming normal distribution, it can be stated with 90% confidence that 90% of the inventory represented by the test samples would fall within this range.
Significant	As used in the statistical sense, means a difference unlikely to have been the result of random sampling from some specified population.
S.D.	Standard Deviation

INTRODUCTION

PURPOSE: The purpose of this program was to continue the surveillance testing of Stage II propellant. This surveillance will elucidate the aging characteristics of the propellant and, using statistical trends derived from the testing, establish the service life of the motor.

BACKGROUND: Surveillance testing was initiated in 1963 on cartons of propellant cast from the same propellant used in motor manufacture.

In 1971, all laboratory prepared insulation material and case to propellant bond specimens were destroyed in a conditioning chamber malfunction. The number of cartons of propellant was also near depletion, which should terminate the surveillance program.

A force modernization program made available some older Minuteman I Stage II motors. Three of these motors were selected to represent the motor inventory and were dissected for laboratory surveillance testing. The motors selected were S/N 0022135, cast in June 1963; S/N 0022583, cast January 1964; and S/N 0022788, cast in July 1964.

The amount of propellant available from motor S/N 0022583 was sufficient for only four test periods. Motors S/N 0022135 and S/N 0022788 contained sufficient propellant for seven (7) test periods. To date, six annual test periods have been completed on an annual basis.

No insulation materials from the three motors were available for testing since all materials were depleted during the fourth test period.

DISSECTION: The motors were dissected and cut into sections and then guillotined into segments as illustrated in figures 1 and 2 respectively. Propellant specimen orientations are illustrated in figure 3.

The motors which have been dissected to date are:

Motor S/N	Cast Date
0022135	63162
0022583	64008
0022788	64197

The segments, which were tested during this phase, were taken from section 4. Segments C, D, and E were used for motor S/N 0022135 and segments E, G, and L were used for motor S/N 0022788.

STATISTICAL ANALYSIS

The objective of this statistical analysis is to determine whether or not any aging trends are demonstrated by accumulated test data in order to assist Service Engineering to more accurately predict motor serviceability.

Propellant was made available for testing and statistical analysis to obtain an overall view of the aging trends affecting the Second Stage Dissected Motor Program. In the past, carton data and dissected motor data were combined to yield sufficient samples to perform the analysis. Since there is now sufficient dissected motor data, carton data will not be included in the analysis. This will eleminate a further biasing factor in the results.

A Multi-symbol Regression Analysis Program was used to determine agiug trends. The sampling is combined for each test parameter in a single regression analysis. The linear equation ($Y = a + bX$) was found to be the best fit model for the data in this report. A composite population aging trend line was then calculated accepting the fact that individual aging of different motors may be masked.

The Multi-symbol Program uses a unique plotting code for each motor on the regression plots. This method of data plotting allows a visual display of the overall relationship between motors and how they relate to the overall least square aging trend line.

The regression program uses an analysis with individual data points from different time periods combined to establish a least squares aging

trend line for the overall data. The variance about the regression line, obtained using individual values of the dependent variable, was used to compute a tolerance interval such that at the 90% confidence level 90% of the population falls within this interval. This tolerance interval was extrapolated to a maximum of 24 months to give an indication of the statistical significance of the slope of any aging trends. The computed tolerance interval about the composite regression line is wider than what the tolerance interval would be about any individual motor regression line because of the increased data spread introduced by combining data from different motors. The 't' values and the significance of this statistic, which are reported for each regression model, gives an indication of the "statistical significance" of the slope of the aging trend in the Y-axis. A slope of the trend approaching a zero slope will be indicated as being "statistically not-significant." Data and regression trend lines were plotted utilizing an IBM-360/65 computer.

The accuracy of the statistical inference improves as the sampling becomes larger. An analysis of the slope of the trend lines revealed the majority are becoming flatter:

Motor	Symbol
0022135	□
0022583	○
0022788	△

A summation of all of the regression analyses, the significance of the trend line slope and the direction of the slope, either positive or negative, is presented in Table 17.

TEST RESULTS

A. UNIAXIAL TENSILE TEST:

The results of the tensile testing for the propellant samples cut in the axial orientation are summarized in Table 1. The test parameters (temperature in degrees F and crosshead speed in in/min) which had sufficient data to give meaningful regression analyses were analyzed and are presented as figures 4 thru 15. Comparison of the regression results of this test phase with the analysis from the previous test phase indicates very little change in the statistical significance of the trend lines.

The trend lines for the maximum stress, strain at rupture and modulus of the inner propellant tested at 77°F and 0.0002 in/min show a decrease in slope from the previous corresponding trend lines. The maximum stress and modulus of the inner and outer propellant tested at 77°F and 2.0 in/min also show a decrease in trend line slopes. The decreasing slope has changed the significance of the modulus trend line from significant to not-significant.

B. BI-PROPELLANT TENSILE TEST:

The results from this test period are contained in Tables 2 and 3. The regression analysis of the bi-propellant specimens (with a test temperature of 20°F) are presented in Figures 16 thru 18. Since this is the first time sufficient data have been available for reliable regression analyses, no comparisons can be made with previous regressions. The statistical analysis indicates a non-significant trend line for maximum stress and strain at rupture and a positive significant trend line for the modulus.

C. BIAXIAL TENSILE TEST:

The regression plots are presented in figures 19 thru 24. The data

obtained during this test phase confirmed the validity of the regression analyses made during the last test phase. No changes were observed except for outer maximum stress which is still significant.

D. HIGH RATE TRIAXIAL TENSILE TEST:

Data from this test period are contained in Table 4. The regression plots are presented as figures 25 thru 30. The maximum stress parameter of the outer propellant has changed from not significant to significant during this test phase. This change is in line with the other parameters which all show significant trends. All of the other parameters for both inner and outer propellant show a decrease in the slope at this test phase.

E. LOW RATE HYDROSTATIC TENSILE TEST:

Data from this test period are contained in Tables 5 and 6. The regression plots are presented in figures 31 thru 42. This is the first time that low rate hydrostatic tensile testing has been analyzed and although a majority of the parameters have significant trend lines, the significance is expected to change as more data becomes available.

F. HIGH RATE HYDROSTATIC TENSILE TEST:

The test results from this test phase can be found in Table 7. The regression plots are presented in figures 43 thru 48. The data from this test phase has increased the trend line slopes in all parameters except outer strain at rupture, which shows a decreasing trend and inner maximum strain changed from significant to not-significant.

G. STRESS RELAXATION TEST:

The stress relaxation data obtained during this test phase are presented in Tables 8 and 9. The master stress relaxation curves at 3% strain are presented as figures 49 thru 52 for the inner and outer propellants of both (S/N 0022135 and S/N 0022788) motors.

The 0.5% strain was discontinued since the data obtained at such low strain rates are questionable as to the validity of the data. Normal cutting and handling of the propellant during sample preparation could impose a strain level greater than 0.5% upon the test sample.

A comparison of the two master curves from the two motors indicate a difference in the relaxation curves of the inner propellants. The master curves of the outer propellants are almost the same.

H. TEAR ENERGY TEST:

Data from this test period are contained in Tables 10 and 11. Sufficient valid data became available to run regression analyses during this test period. A summary of the analysis is presented in Table 17 while the regression plots are presented as figures 53 thru 68. A majority of the plots are not significant.

I. BURNING RATE TEST:

The burning rate data acquired during this test phase are presented in Table 12. The regression plots are presented in figures 69 and 70 for the burning rate at 500 psi initial pressure for both inner and outer propellant. Although the burning rate of the outer propellant is still significant, the slope is not as steep as it was

during the last test phase. The significance of the burning rate of the inner propellant has changed from not significant to significant.

J. HARDNESS TEST:

The Shore A hardness of the outer and inner propellants has a considerable amount of scatter in the data accumulated during the last six test phases. However, the regression analysis continues to indicate a hardening of the inner propellant and a softening of the outer propellant as evidenced by the slope of the trend lines. The regression analyses are presented as figures 71 and 72 for the outer and inner propellants respectively. The test data can be found in Table 13.

K. THERMAL COEFFICIENT OF LINEAR EXPANSIONS (TCLE) TEST:

The regression analysis of the TCLE data is divided into two parts. One regression was concerned only with the expansion coefficient above the glass point and the second was concerned with the expansion coefficient below the glass point. The regression analysis of the outer propellant below the glass point continues to be not significant, although the trend line slope is steeper than the corresponding slope of the last test phase.

The coefficient for the inner propellant below the glass point changed from not significant to significant during this test phase. The coefficient of expansion above the glass point for the inner and outer propellant continues to have a "not significant" trend line slope. The slope has decreased or become slightly flatter during this test phase.

The regression analyses are presented as figures 73 thru 76 and the individual data obtained during this test phase are presented in Table 14.

L. BOND CONSTANT LOAD TEST:

The bond constant load data for both tensile and shear are summarized in Table 15. The data has a considerable amount of variance which precludes any statistical analysis. The most interesting part of this test is the failure modes of the specimens. The tensile loads for motor 0022135 failed adhesively liner to propellant where as the failure mode for motor 0022788 was mostly at the propellant interface with a very fine layer of propellant remaining on the liner.

The shear specimens failed mostly at the propellant interface with a corresponding lower recorded failure time. It is not known if the cohesively failed specimens had an abnormally soft propellant. Examination of other data did not indicate any abnormalities which could explain the unusual failure mode.

M. CONSTANT STRAIN TEST:

The constant strain test was performed by applying an initial strain to JANNAF dogbones that will cause one set of specimens to break in approximately seven hours, another set in 3 days, and another set in 30 days. However, the results were so erratic that is is impossible to interpret them. One specimen of the 30 day test would break at 4 days, another at 29 days, and another specimen of the set would not break within 35 days. Similar results were obtained for the 7 hour test and the 3 day test. As a result of this inconsistency, no data is being presented in this report. It is also recommended that this test be dropped from the test program in future test phases.

N. SOL GEL TEST:

The regression analyses of the various parameters obtained from sol gel testing are presented as figures 77 thru 86. The data for this test are summarized in Table 16.

The gel-swell ratio for the outer and inner propellants changed from a significant trend to a non-significant trend. The remaining parameters for the outer propellant retained the same or somewhat flatter trend line.

The mass density, crosslink density and the % extractables of the inner propellant changed from a significant to a not-significant trend. The slope of the trend line for the mass density shows a decreasing trend. As more data becomes available, the trend lines are becomming closer to a line of zero slope.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS:

The regression analysis of all data obtained from the physical and thermal testing have indicated a majority of the test parameters have a "not significant" trend line slope (105 parameters). Of those trend lines which are significant, 23 have negative trend line slopes and 49 have positive slopes.

Several of the analyses are based on a limited amount of data and therefore may change as more data becomes available.

From these analyses, no apparent problems were observed that would indicate any problem areas which might affect motor performance or service life of the motor.

RECOMMENDATIONS:

1. The constant strain test has shown to be very erratic. The data obtained varies from 4 days to failure to 35 days. As a result, it is impossible to interpret the data. It is recommended that this test be deleted from future test programs.

2. There remains sufficient dissected propellant in storage to complete only one more test program. It is recommended that this propellant remain in storage until another dissected motor can be obtained. The two or three motors can then be compared to establish a motor- to-motor bias.

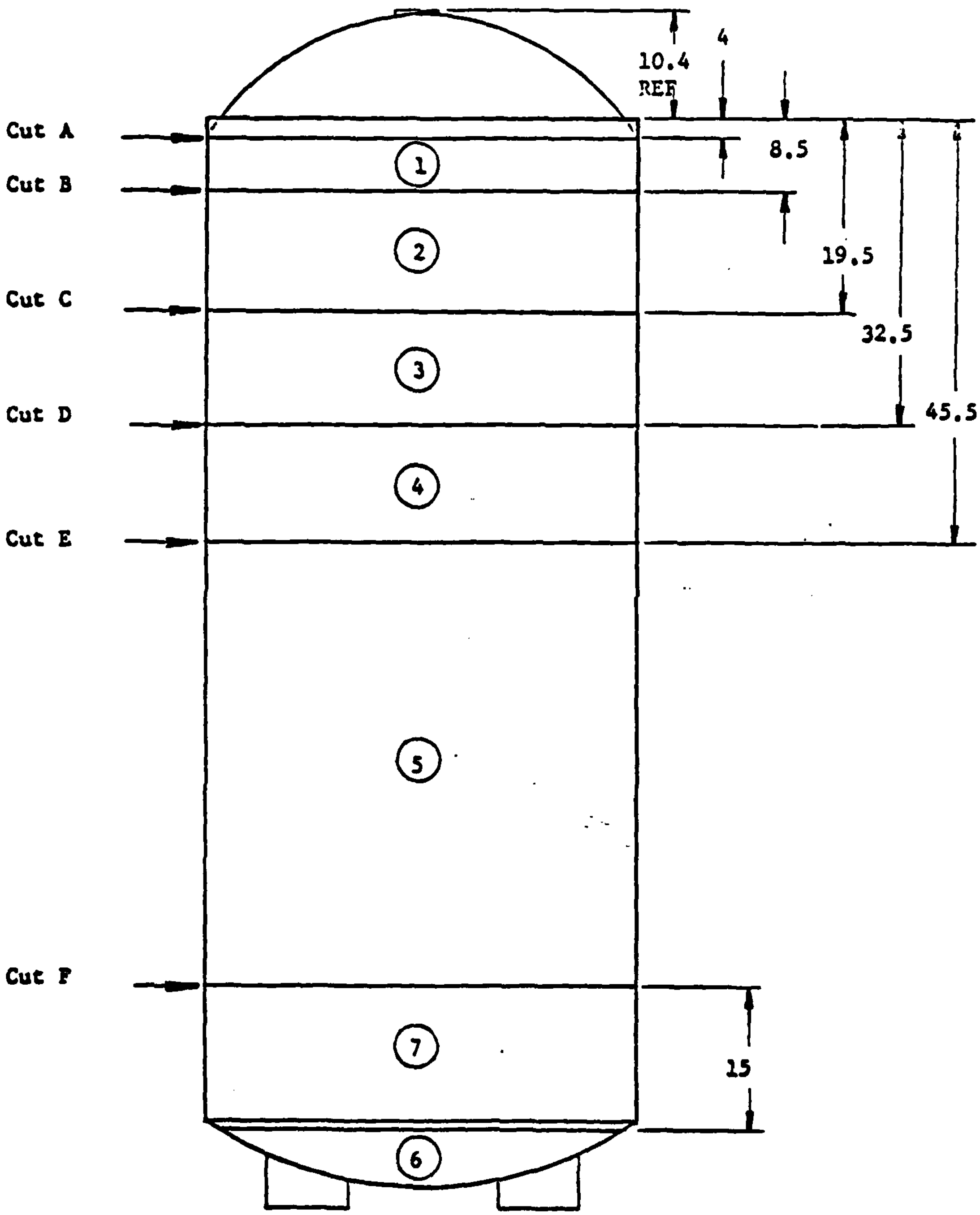


Figure 1 Dissection layout of Cuts, Locations and Section Numbers

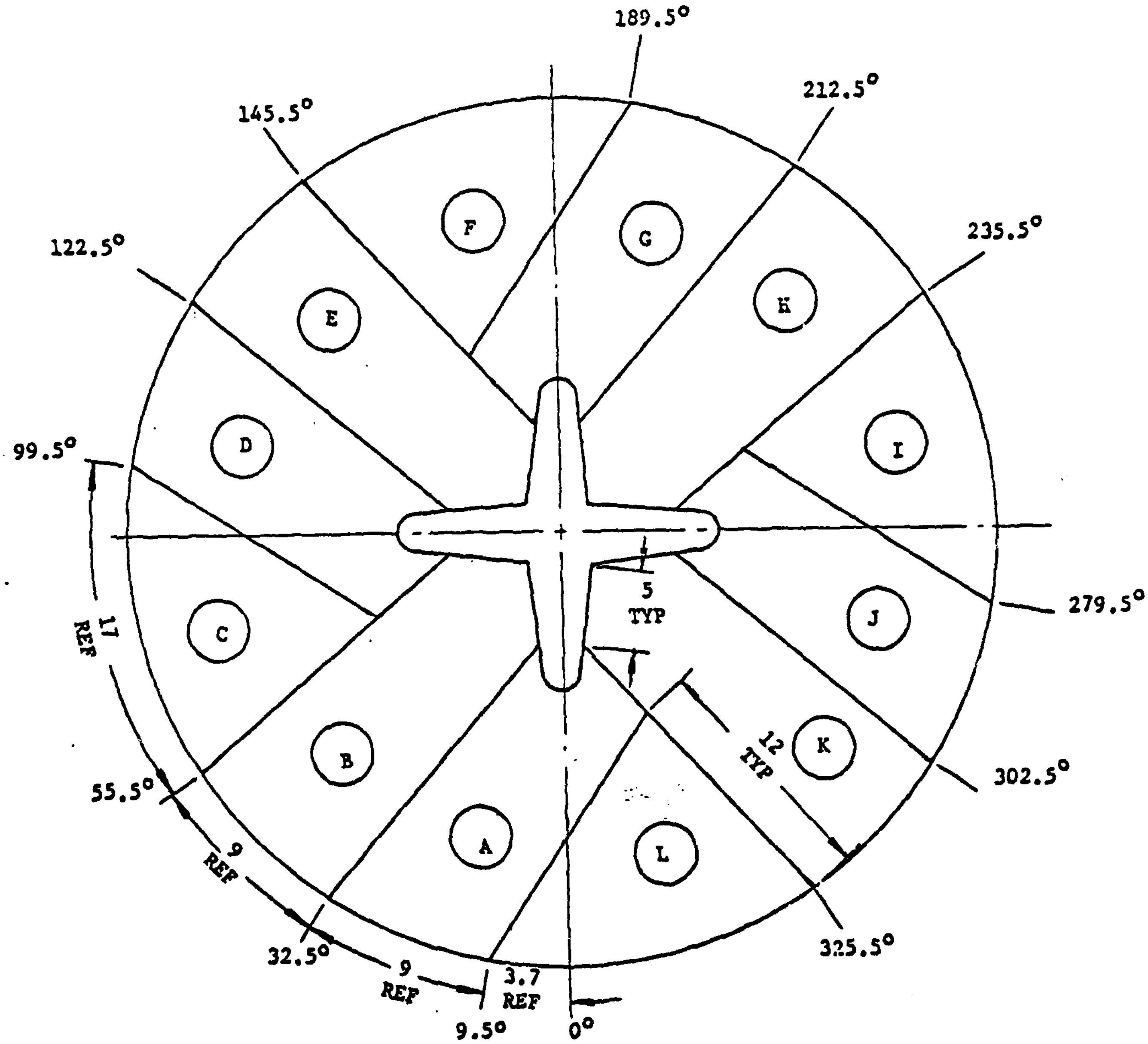


Figure 2 Section 3 and 4 Segment
Layout and Letter Identification

This figure illustrates what the various sample orientation terms mean with respect to a segment of the motor.

A JANNAF dogbone is used in the illustration to depict the areas from where the specimens are obtained.

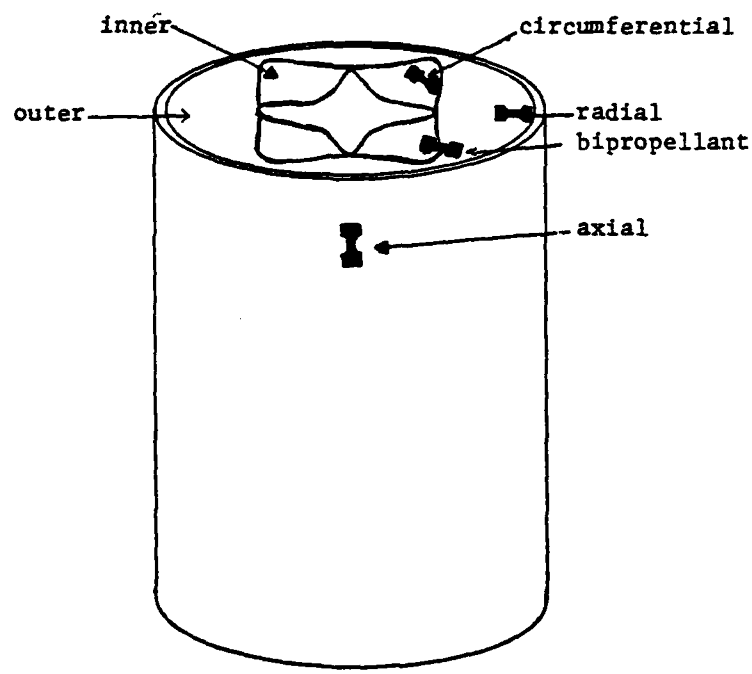


FIGURE 3

TABLE 1

LOW RATE TENSILE TEST DATA
(OUTER PROPELLANT)

Motor S/N	X-head Speed	Test Temp (°F)	Test Date	Age at Test (mo)		Sm psi	er in/in	E psi
0022135	0.0002	77	79299	197		45.3	0.1979	435.0
						37.3	0.1466	374.0
						48.0	0.1991	450.0
					$\bar{X}$ =	43.5	0.1813	419.7
					SD =	5.59	0.030	40.3
		120	79274	196		46.0	0.1979	357.0
						45.5	0.1939	347.0
						41.6	0.2129	339.0
					$\bar{X}$ =	44.4	0.2017	347.7
					SD =	2.45	0.010	9.02
		160	79295	196		39.4	0.2289	239.0
						35.3	0.3399	239.0
						27.9	0.2019	242.0
					$\bar{X}$ =	34.2	0.2203	240.0
					SD =	5.83	0.016	1.73
	0.002	77	79270	196		53.0	0.2352	552.0
						51.5	0.2569	523.0
						48.5	0.2402	498.0
					$\bar{X}$ =	51.0	0.2442	524.3
					SD =	2.31	0.011	27.02
	0.02	77	79261	195		70.8	0.2566	625.0
						67.6	0.2182	597.0
						70.3	0.3199	608.0
					$\bar{X}$ =	69.6	0.2650	610.0
					SD =	1.76	0.051	14.11
		120	79261	195		49.1	0.2887	458.0
						48.8	0.2882	383.0
						49.6	0.2949	399.0
					$\bar{X}$ =	49.2	0.2906	413.3
					SD =	0.404	0.0037	39.5

TABLE 1 (cont)

Motor S/N	X-head Speed	Test Temp (°F)	Test Date	Age at Test (mo)		Sm psi	er in/in	E psi
0022135	0.02	120	79291	196		44.7	0.2719	440.0
						41.1	0.2829	426.0
						34.2	0.2419	87.0
					$\bar{X}$ =	40.0	0.2656	317.7
					SD =	5.336	0.0212	199.9
	0.2	20	79260	195		222.4	0.4244	3159.0
						223.4	0.4228	3211.0
						221.7	0.3854	3068.0
					$\bar{X}$ =	222.5	0.4109	3146.0
					SD =	0.86	0.022	72.38
	2.0	20	79260	195		307.6	0.3606	5921.0
						316.4	0.4038	5967.0
					$\bar{X}$ =	312.0	0.3823	5944.0
					SD =	6.18	0.031	32.53
		77	79257	195		120.3	0.4829	1189.0
						117.9	0.5749	1180.0
						114.4	0.4249	1143.0
					$\bar{X}$ =	117.5	0.4943	1170.7
					SD =	2.97	0.076	24.38
	20.0	20	79257	195		421.3	0.2983	11487.0
						438.2	0.3316	11971.0
						429.4	0.3052	11447.0
					$\bar{X}$ =	429.6	0.3118	11635.0
					SD =	8.46	0.018	291.7
0022788	0.0002	77	79299	183		46.6	0.2480	359.0
						45.2	0.2221	358.0
						42.9	0.2439	327.0
					$\bar{X}$ =	44.9	0.238	348.0
					SD =	1.869	0.014	18.2
		120	79304	184		46.5	0.3229	227.0
						48.8	0.3099	249.0
						47.6	0.1769	270.0
					$\bar{X}$ =	47.6	0.270	248.7
					SD =	1.66	0.0808	21.5

TABLE 1 (cont)

Motor S/N	X-head Speed	Test Temp (°F)	Test Date	Age at Test (mo)		Sm psi	er in/in	E psi
0022788	0.0002	160	79295	183		34.3	0.3699	180.0
						34.1	0.4229	156.0
						34.6	0.3899	157.0
					$\bar{X}$ =	34.3	0.3943	164.3
					SD =	0.220	0.0268	13.6
	0.002	77	79298	183		50.2	0.3372	353.0
						55.1	0.2759	413.0
						52.3	0.3092	398.0
					$\bar{X}$ =	52.5	0.3075	388.0
					SD =	2.42	0.031	31.2
	0.002	120	79291	183		49.2	0.3999	282.0
						49.5	0.3639	278.0
						49.6	0.3469	298.0
					$\bar{X}$ =	49.4	0.3703	286.0
					SD =	0.208	0.0271	10.6
	0.02	77	79290	183		69.5	0.3743	479.0
						66.3	0.4299	390.0
						64.8	0.4766	274.0
					$\bar{X}$ =	66.8	0.427	414.3
					SD =	2.40	0.0512	56.6
		120	79291	183		53.9	0.3166	392.0
						54.8	0.3099	401.0
						55.4	0.3077	409.0
					$\bar{X}$ =	54.7	0.3115	400.7
					SD =	0.766	0.0046	8.5
	0.2	20	79275	183		181.5	0.5463	1781.0
						190.9	0.5366	2020.0
						193.0	0.5301	2089.0
					$\bar{X}$ =	188.5	0.5378	1963.3
					SD =	6.16	0.0082	161.6
		77	79275	183		78.0	0.5203	520.0
						80.1	0.4884	570.0
						74.5	0.5848	437.0
					$\bar{X}$ =	77.5	0.5313	509.0
					SD =	2.801	0.0491	67.2

TABLE 1 (cont)

Motor S/N	X-head Speed	Test Temp (^{o}F)	Test Date	Age at Test (mo)		Sm psi	er in/in	E psi
0022788	2.0	20	79275	183		257.5	0.5143	3756.0
						270.0	0.4481	3774.0
						265.4	0.4614	3908.0
					$\bar{X}$ =	264.3	0.4747	3812.7
					SD =	6.30	0.03502	83.1
		77	79275	183		110.6	0.6278	860.0
						111.3	0.5661	853.0
						111.9	0.5095	885.0
					$\bar{X}$ =	111.3	0.5679	866.0
					SD =	0.662	0.0592	16.8
	20.0	20	79275	183		378.0	0.3267	8921.0
						379.7	0.2997	9914.0
						383.3	0.3213	9393.0
					$\bar{X}$ =	380.3	0.3160	9409.3
					SD =	2.690	0.0143	496.7

INNER PROPELLANT

Motor S/N	X-head Speed	Test Temp (^{o}F)	Test Date	Age at Test (mo)		Sm psi	er in/in	E psi
0022135	0.0002	77	79299	197		55.3	0.2832	284.0
						56.0	0.2697	291.0
						56.2	0.2859	280.0
						57.1	0.2969	338.0
						56.2	0.3059	367.0
						63.8	0.2966	358.0
					$\bar{X}$ =	57.4	0.2898	319.7
					SD =	3.18	0.0128	39.3
	0.0002	120	79274	196		47.5	0.2989	199.0
						50.3	0.2959	248.0
						49.4	0.2919	255.0
						44.2	0.2899	253.0
						43.3	0.3009	244.0
						53.1	0.2329	345.0
					$\bar{X}$ =	48.0	0.2852	257.3
					SD =	3.74	0.0259	47.7

TABLE 1 (cont)

Motor S/N	X-head Speed	Test Temp (°F)	Test Date	Age at Test (mo)		Sm psi	er in/in	E psi
0022135	0.0002	160	79295	196		53.4	0.3179	279.0
						53.0	0.2709	306.0
						54.6	0.2809	324.0
					$\bar{X}$ =	53.8	0.2900	303.0
					SD =	0.832	0.0248	22.65
	0.002	77	79270	196		75.0	0.3069	592.0
						58.5	0.3292	379.0
						61.4	0.3646	451.0
					$\bar{X}$ =	65.0	0.3337	474.0
					SD =	8.82	0.0291	108.3
	0.02	77	79261	195		96.7	0.4266	595.0
						94.6	0.3966	599.0
						94.9	0.3582	698.0
					$\bar{X}$ =	95.4	0.3939	630.7
					SD =	1.11	0.03429	58.35
	0.02	120	79261	195		62.6	0.3249	398.0
						63.6	0.3316	413.0
						62.6	0.3482	428.0
						63.2	0.2969	429.0
						63.4	0.2569	513.0
						63.5	0.2929	499.0
					$\bar{X}$ =	63.2	0.3087	446.7
					SD =	0.449	0.0329	47.54
	0.2	77	79257	195		121.2	0.4769	995.0
						90.9	0.4139	924.0
						90.7	0.3929	841.0
						82.4	0.4649	656.0
						125.0	0.4649	857.0
						123.1	0.5809	710.0
					$\bar{X}$ =	105.6	0.4658	830.5
					SD =	19.56	0.0654	127.7
	2.0	20	79260	195		337.6	0.4264	6362.0
						329.0	0.4141	5127.0
						334.7	0.4588	6031.0
					$\bar{X}$ =	333.8	0.4332	5840.0
					SD =	4.378	0.0231	639.3

TABLE 1 (cont)

Motor S/N	X-head Speed	Test Temp (°F)	Test Date	Age at Test (mo)		Sm psi	er in/in	E psi
0022135	2.0	77	79257	195		159.6	0.5689	1146.0
						159.2	0.5209	1600.0
						158.3	0.4589	1476.0
					$\bar{X}$ =	159.1	0.5163	1407.3
					SD =	0.654	0.0551	0.0235
	20.0	20	79260	195		402.3	0.2996	10135.0
						398.6	0.2643	10442.0
						392.3	0.2937	9968.0
						451.3	0.4212	11540.0
						445.6	0.4489	10579.0
						440.2	0.3814	10733.0
					$\bar{X}$ =	421.7	0.3516	10566.2
					SD =	26.7	0.076	554.2
0022788	0.0002	77	79299	183		47.4	0.3137	244.0
						46.4	0.2868	240.0
						46.3	0.2859	241.0
						37.8	0.2759	208.0
						38.4	0.2909	214.0
						39.5	0.2919	209.0
					$\bar{X}$ =	42.6	0.2909	226.0
					SD =	4.51	0.0126	17.33
	0.0002	120	79304	184		42.6	0.3397	153.0
						48.3	0.3429	226.0
						45.6	0.3279	210.0
						39.0	0.3019	170.0
						39.3	0.2989	169.0
						38.1	0.3069	176.0
					$\bar{X}$ =	42.16	0.3198	184.0
					SD =	4.10	0.0196	27.88
	0.0002	160	79295	183		44.1	0.3719	166.0
						45.9	0.4009	173.0
						44.5	0.3699	178.0
					$\bar{X}$ =	44.8	0.3810	172.3
					SD =	0.964	0.0173	6.028

TABLE 1 (cont)

Motor S/N	X-head Speed	Test Temp (^{o}F)	Test Date	Age at Test (mo)		Sm psi	er in/in	E psi
0022788	0.002	77	79298	183		55.5	0.3826	261.0
						54.7	0.3826	262.0
						55.1	0.3492	257.0
					$\overline{X}$ =	55.1	0.3716	260.0
					SD =	0.396	0.0193	2.646
	0.002	120	79291	183		60.0	0.4049	259.0
						51.2	0.3759	260.0
					$\overline{X}$ =	55.6	0.3905	259.5
					SD =	6.223	0.0205	0.707
	0.02	77	79290	183		67.2	0.4599	302.0
						68.9	0.3866	296.0
						71.8	0.4655	303.0
					$\overline{X}$ =	69.3	0.4374	300.3
					SD =	2.301	0.0440	3.786
	0.02	120	79291	183		50.2	0.3632	244.0
						50.3	0.4577	249.0
						50.6	0.4443	240.0
						50.0	0.2279	254.0
					$\overline{X}$ =	50.3	0.3734	246.8
					SD =	0.2601	0.1055	6.076
	0.2	20	79275	183		196.8	0.5148	1593.0
						191.5	0.6713	1714.0
						195.2	0.5906	1340.0
					$\overline{X}$ =	194.5	0.5923	1549.0
					SD =	2.718	0.07826	190.84
	2.0	77	79274	183		88.0	0.6109	415.0
						90.5	0.6026	387.0
						90.0	0.5407	455.0
					$\overline{X}$ =	89.5	0.5847	419.0
					SD =	1.32	0.0384	34.18
	2.0	20	79275	183		279.0	0.6114	3892.0
						270.6	0.7294	3683.0
						274.4	0.6652	3859.0
					$\overline{X}$ =	274.7	0.6654	3812.3
					SD =	4.215	0.0597	110.65

TABLE 1 (cont)

Motor S/N	X-head Speed	Test Temp (^{o}F)	Test Date	Age at Test (mo)		Sm psi	er in/in	E psi
0022788	2.0	77	79275	183		115.6	0.5492	687.0
						114.3	0.7014	703.0
						115.7	0.6844	725.0
					$\overline{X}$ =	115.2	0.6451	705.0
					SD =	0.796	0.0834	19.08
	20.0	20	79275	183		389.3	0.4488	11438.0
						391.7	0.4210	11689.0
						375.0	0.2615	10434.0
						372.7	0.3787	9573.0
						381.0	0.3667	9400.0
						390.3	0.4643	10838.0
					$\overline{X}$ =	383.4	0.3903	10562.0
					SD =	8.265	0.07365	944.3

TABLE 2

BI-PROPELLANT TEST DATA
2 in. GL Dogbones

Motor S/N	Test Temp (°F)	X-head Speed (in/min)	Test Date	Age at Test (mo)		Sm (psi)	er (in/in)	E (psi)
0022135	20	20.0	79260	195		445.8	0.3198	9225
						346.3	0.2547	5581
						436.7	0.3383	9263
					$\bar{X}$ =	409.6	0.3043	8023
					SD =	55	0.04	2115
0022135	77	0.0002	79299	197		35.6	0.1820	303
						37,4	0.1930	315
						35.2	0.2020	293
					$\bar{X}$ =	36.1	0.1923	304
					SD =	1.2	0.01	11
0022135	120	0.0002	79274	196		33.7	0.1890	259
						32.8	0.1800	265
						36.8	0.2420	222
					$\bar{X}$ =	34.4	0.2037	249
					SD =	2.1	0.03	23
0022788	20	20.0	79275	183		354.8	0.2639	9121
						353.4	0.2224	8321
						353.9	0.2545	8470
					$\bar{X}$ =	354.0	0.2469	8637
					SD =	0.7	0.02	425
0022788	77	0.0002	79299	183		35.3	0.2800	201
						37.4	0.2600	228
						36.3	0.2700	216
					$\bar{X}$ =	36.3	0.2700	215
					SD =	1.1	0.01	14
0022788	120	0.0002	79304	184		39.1	0.2820	185
						37.6	0.2740	194
						38.4	0.2753	187
					$\bar{X}$ =	38.4	0.2753	189
					SD =	0.7	0.01	5

TABLE 3

BI-PROPELLANT TEST DATA
3/4 in GL Dogbones

Motor S/N	Test Temp (°F)	X-Head Speed (in/min)	Test Date	Age at Test (mo)		Sm (psi)	er (in/in)	E (psi)
0022135	20	2.0	79275	196		285.1	0.2616	6657
						255.0	0.2966	3833
						273.8	0.3060	4361
						267.7	0.2463	4993
					$\overline{X}$ =	270.4	0.2776	4961
					SD =	13	0.03	1226
0022135	77	0.2	79277	196		199.0	0.3949	1276
						198.9	0.4287	1295
						198.9	0.4203	1296
						192.3	0.4244	1192
					$\overline{X}$ =	197.3	0.4171	1265
					SD =	3.3	0.02	49
0022135	77	2.0	79277	196		269.5	0.5342	1907
						272.9	0.5242	1903
						272.0	0.4546	2145
						259.6	0.5187	2093
					$\overline{X}$ =	268.5	0.5079	2012
					SD =	6.1	0.04	125
0022788	20	2.0	79276	183		286.6	0.4065	3533
						285.5	0.3457	3736
						288.6	0.3733	3695
					$\overline{X}$ =	286.9	0.3752	3655
					SD =	1.6	0.03	107
002278	77	0.2	79276	183		82.8	0.4480	395
						88.7	0.4416	499
						87.9	0.4448	494
						87.0	0.3819	474
					$\overline{X}$ =	86.6	0.4291	4655
					SD =	2.6	0.03	48
0022788	77	2.0	79276	183		119.5	0.4943	740
						120.5	0.5881	758
						118.1	0.5904	776
						116.9	0.5112	771
					$\overline{X}$ =	118.8	0.5460	761.3
					SD =	1.6	0.05	16

TABLE 4

TRIAXIAL TENSILE TEST DATA
X-Head Speed 1750 in/min, 500 psi, 77°F

Prop Type	Motor S/N	Test Date	Age at Test (mo)		Sm (psi)	er (in/in)	E (psi)
Outer	0022135	79267	196		596.7	0.4151	5230
					592.8	0.3884	4943
					595.1	0.4015	4822
				$\bar{X}$ =	594.9	0.4017	4998
				SD =	2.0	0.01	210
Outer	0022788	79283	183		600.8	0.3633	5583
					604.8	0.3575	5474
					617.8	0.3470	5698
				$\bar{X}$ =	607.8	0.3559	5585
				SD =	8.9	0.008	112
Inner	0022135	79267	196		634.8	0.5330	4409
					642.1	0.5398	4461
					621.0	0.5518	4174
				$\bar{X}$ =	632.6	0.5003	4348
				SD =	11.0	0.02	153
Inner	0022788	79267	183		610.2	0.5896	5417
					613.0	0.5747	5241
					605.1	0.4978	4838
				$\bar{X}$ =	609.4	5446	5165
				SD =	4.0	0.004	297

TABLE 5

LOW RATE HYDROSTATIC TENSILE TEST DATA

(outer Propellant) 500 psi, $20^{o}F$

Motor S/N	X-Head Speed (in/min)	Test Date	Age at Test (mo)		Sm (psi)	er (in/in)	E (psi)
0022135	2.0	79270	196		547.7	0.2251	6313
					543.5	0.2509	6786
					542.2	0.3000	6648
				$\bar{X}$ =	544.5	0.2587	6582
				SD	2.9	0.04	243
0022135	20.0	79270	196		573.3	0.2314	8365
					583.5	0.3284	7476
					598.3	0.3110	9679
				$\bar{X}$ =	585.0	0.2903	8507
				SD	13.0	0.05	1108
0022788	2.0	79289	183		460.1	0.3953	4004
					549.5	0.3279	6207
					503.6	0.3500	5977
				$\bar{X}$ =	504.4	0.3577	5396
				SD =	45.0	0.03	1211
0022788	20.0	79289	183		618.1	0.2880	9141
					582.7	0.2764	7835
					670.5	0.2248	15322
				$\bar{X}$ =	623.8	0.2631	10766
				SD =	44.0	0.03	3999

TABLE 6

LOW RATE HYDROSTATIC TENSILE TEST DATA
500 psi, 20°F

(inner propellant)

Motor S/N	X-Head Speed (in/min)	Test Date	Age at Test (mo)		Sm (psi)	er (in/in)	E (psi)
0022135	2.0	79270	196		589.7	0.4106	6550
					509.8	0.3873	4981
					511.1	0.4030	6148
				$\bar{X}$ =	536.9	0.4003	5893
				SD =	46.0	0.01	815
0022135	20.0	79270	196		652.5	0.3798	8378
					667.8	0.3622	9687
					613.7	0.4278	6982
				$\bar{X}$ =	644.7	0.3899	8349
				SD =	28.0	0.03	1353
0022788	2.0	79289	183		516.6	0.4955	4353
					532.2	0.4899	4790
					559.1	0.4907	5582
				$\bar{X}$ =	536.0	0.4920	4908
				SD =	22.0	0.003	623
0022788	20.0	79289	183		631.4	0.3858	9559
					625.1	0.4111	9751
					567.3	0.5013	7272
				$\bar{X}$ =	607.9	0.4327	8861
				SD =	35.0	0.06	1379

TABLE 7

HIGH RATE HYDROSTATIC TENSILE TEST DATA
500 psi, 77°F, 1750 in/min

Type Prop	Motor S/N	Test Date	Age at Test (mo)		Sm (psi)	er (in/in)	E (psi)
Outer	0022135	79283	197		572.5	0.4090	5458
					581.1	0.4220	6293
					578.0	0.4017	5401
				$\bar{X}$ =	577.2	0.4109	5717
				SD =	4.3	0.01	499
Outer	0022788	79283	183		564.9	0.3656	6584
					570.4	0.3450	5581
					562.3	0.4010	6559
				$\bar{X}$ =	565.9	0.3705	6241
				SD =	4.2	0.03	572
Inner	0022135	79283	197		617.1	0.5180	6327
					608.8	0.4800	5867
					571.4	0.5029	6610
				$\bar{X}$ =	599.1	0.5003	6268
				SD =	24.0	0.02	375
Inner	0022788	79283	183		574.4	0.5484	4784
					590.2	0.5455	6406
					587.9	0.5400	5350
				$\bar{X}$ =	584.2	0.5446	5513
				SD =	8.6	0.004	823

TABLE 8

STRESS RELAXATION TEST DATA
3% Strain, Outer Propellant

Motor S/N	Test Temp	Test Date	Age at Test (mo)		10 sec (psi)	50 sec (psi)	100 sec (psi)	1000 sec (psi)
0022135	-40	79264	195		13470	8310	6937	4183
					10573	6590	5630	4183
					11247	7037	5977	4427
				$\bar{X}$ =	12022	7312	6181	4264
				SD =	2048	892	677	141
0022135	20	79264	195		2060	1197	1013	610
					2120	1247	1050	627
					2183	1280	1070	637
				$\bar{X}$ =	2121	1241	1044	625
				SD =	62	42	29	14
0022135	77	79264	195		710	527	517	400
					750	563	483	423
					733	550	507	420
				$\bar{X}$ =	731	547	502	414
				SD =	25	21	19	13
0022135	100	79264	195		620	490	460	393
					670	530	497	417
					647	520	487	397
				$\bar{X}$ =	646	513	481	402
				SD =	25	21	19	13
0022135	140	79264	195		463	407	377	333
					490	420	400	343
					507	420	397	327
				$\bar{X}$ =	487	416	391	334
				SD =	22	8	13	8
0022135	180	79264	195		410	347	320	247
					437	363	340	260
					427	363	337	273
				$\bar{X}$ =	425	358	332	260
				SD =	14	9	11	13
0022788	-40	79277	183		13910	8590	7157	3973
					12560	7773	6580	4200
					13480	8373	7013	4117
				$\bar{X}$ =	13317	8245	6917	4097
				SD =	690	423	300	115

TABLE 8 (cont)

Motor S/N	Test Temp	Test Date	Age at Test (mo)	10 sec (psi)	50 sec (psi)	100 sec (psi)	1000 sec (psi)
0022788	20	79277	183	2210	1237	1013	553
				2233	1260	1030	583
				2143	1200	987	560
				$\overline{X}$ = 2195	1232	1010	565
				SD = 47	30	22	16
0022788	77	79277	183	570	387	343	263
				640	447	403	310
				703	493	447	343
				$\overline{X}$ = 638	442	398	305
				SD = 67	53	52	40
0022788	100	79277	183	497	377	320	227
				507	400	337	243
				497	390	323	230
				$\overline{X}$ = 500	389	327	233
				SD = 6	12	9	9
0022788	140	79277	183	323	267	250	203
				353	293	277	220
				383	313	293	233
				$\overline{X}$ = 353	291	273	219
				SD = 30	23	22	15
0022788	180	79277	183	283	237	213	153
				290	237	220	160
				287	237	220	160
				$\overline{X}$ = 287	237	218	158
				SD = 4	0	4	4

TABLE 9

STRESS RELAXATION TEST DATA
3% Strain, Inner Propellant

Motor S/N	Test Temp	Test Date	Age at Test (mo)		10 sec (psi)	50 sec (psi)	100 sec (psi)	1000 sec (psi)
0022135	-40	79264	195		9427	5773	4973	3853
					8840	5460	4613	3223
					12853	8080	6833	4557
				$\bar{X}$ =	10373	6438	5473	3878
				SD =	2167	1431	1191	667
0022135	20	79264	195		2363	1387	1147	680
					2343	1433	1210	730
					2097	1263	1063	643
				$\bar{X}$ =	2268	1361	1140	684
				SD =	148	88	74	44
0022135	77	79264	195		640	467	427	343
					557	407	367	297
					527	383	347	280
				$\bar{X}$ =	575	419	380	307
				SD =	59	43	42	33
0022135	100	79264	195		390	303	283	243
					537	423	397	330
					543	427	397	333
				$\bar{X}$ =	490	322	359	302
				SD =	87	17	66	51
0022135	140	79264	195		470	403	367	323
					443	367	347	300
					430	360	337	297
				$\bar{X}$ =	448	377	350	307
				SD =	20	23	15	14
0022135	180	79264	195		407	340	323	277
					407	340	320	273
					403	337	317	263
				$\bar{X}$ =	406	339	320	271
				SD =	2	2	3	7

TABLE 9 (cont)

Motor S/N	Test Temp	Test Date	Age at Test (mo)		10 sec (psi)	50 sec (psi)	100 sec (psi)	1000 sec (psi)
0022788	-40	79277	183		20977	13277	11140	6280
					18210	11370	9663	6123
					13707	8573	7270	4673
				$\bar{X}$ =	17631	11073	9358	5692
				SD =	3669	2366	1953	886
0022788	20	79277	183		1627	870	687	353
					1600	870	700	360
					1513	820	660	340
				$\bar{X}$ =	1580	853	682	351
				SD =	60	29	20	10
0022788	77	79277	183		357	233	210	160
					350	233	207	157
					387	260	233	170
				$\bar{X}$ =	365	242	217	162
				SD =	20	16	14	7
0022788	100	79277	183		313	230	197	160
					317	233	200	163
					307	230	197	153
				$\bar{X}$ =	312	231	198	159
				SD =	5	2	2	5
0022788	140	79277	183		237	200	190	160
					233	193	180	143
					223	183	170	140
				$\bar{X}$ =	231	192	180	148
				SD =	7	9	10	11
0022788	180	79277	183		187	157	147	117
					200	167	157	123
					203	170	160	127
				$\bar{X}$ =	197	165	155	122
				SD =	9	7	7	5

TABLE 10

COHESIVE TEAR ENERGY TEST DATA
Outer Propellant
Nr Specimens Per Group = 3

Motor S/N	Test Temp	Test Date	Age at Test (mo)	X - Head Speed (in/min)	$\overline{X}$ (in-lb/in^2)	Std Dev
0022135	40	79264	195	0.01	1.958	0.082
				0.10	2.185	0.057
				1.00	4.308	0.395
	77	79264	195	0.01	0.767	0.282
				0.10	1.950	0.071
				1.00	2.211	0.323
	120	79264	195	0.01	0.708	0.164
				0.10	1.087	0.239
				1.00	1.644	0.116
	160	79264	195	0.01	0.558	0.329
				0.10	0.969	0.317
				1.00	1.646	0.458
0022788	40	79277	183	0.01	0.981	0.231
				0.10	2.367	0.422
				1.00	3.665	0.525
	77	79277	183	0.01	0.843	0.171
				0.10	1.272	0.077
				1.00	2.257	0.132
	120	79277	183	0.01	0.637	0.197
				0.10	1.122	0.204
				1.00	1.558	0.087
	160	79277	183	0.01	0.328	0.055
				0.10	0.636	0.128
				1.00	1.277	0.152

TABLE 11

COHESIVE TEAR ENERGY TEST DATA
Inner Propellant
Nr Specimens per Group = 3

Motor S/N	Teat Temp	Test Date	Age at Test (mo)	X-Head Speed (in/min)	$\bar{X}$ (in-lb/in^2)	Std Dev
0022135	40	79261	195	0.01	2.150	0.419
				0.10	3.478	1.086
				1.00	5.497	1.482
	77	79261	195	0.01	1.379	0.352
				0.10	0.911	0.099
				1.00	2.479	1.359
	120	79261	195	0.01	0.870	0.128
				0.10	1.369	0.043
				1.00	2.323	0.031
	160	79261	195	0.01	0.871	0.073
				0.10	1.425	0.086
				1.00	2.032	0.170
0022788	40	79295	183	0.01	1.931	0.521
				0.10	2.693	0.161
				1.00	5.252	1.167
	77	79295	183	0.01	1.626	0.334
				0.10	1.903	0.191
				1.00	3.564	0.602
	120	79295	183	0.01	1.012	0.436
				0.10	1.532	0.083
				1.00	2.655	0.709
	160	79295	183	0.01	0.692	0.097
				0.10	0.939	0.128
				1.00	1.601	0.110

TABLE 12

BURN RATE TEST DATA
350 psi

Type Prop	Motor S/N	Test Date	Age at Test (mo)	Burn Rate (in/sec)
Outer	0022135	79291	197	0.248
				0.250
				0.253
				$\bar{X}$ = 0.250
				SD = 0.003
Outer	0022788	79291	185	0.242
				0.245
				0.249
				$\bar{X}$ = 0.245
				SD = 0.004
Inner	0022135	79292	197	0.372
				0.358
				0.354
				$\bar{X}$ = 0.361
				SD = 0.009
Inner	0022788	79292	185	0.349
				0.353
				0.355
				$\bar{X}$ = 0.352
				SD = 0.003
		500 psi		
Outer	0022135	79291	197	0.299
				0.301
				0.309
				$\bar{X}$ = 0.303
				SD = 0.005
Outer	0022788	79291	185	0.267
				0.255
				0.248
				$\bar{X}$ = 0.257
				SD = 0.01
Inner	0022135	79292	197	0.397
				0.423
				0.411
				$\bar{X}$ = 0.410
				SD = 0.013
Inner	0022788	79292	185	0.353
				0.353
				0.351
				$\bar{X}$ = 0.352
				SD = 0.001

TABLE 13

SHORE A HARDNESS TEST DATA
(non-oriented)

Type Prop	Motor S/N	Test Date	Age at Test (mo)	Hardness at 10 sec
Outer	0022135	79257	195	73
				71
				72
				70
				70
				72
				72
				70
				$\bar{X}$ = 71.3
				SD = 1.165
Outer	0022788	79257	183	62
				61
				62
				63
				58
				60
				59
				58
				$\bar{X}$ = 60.4
				SD = 1.923
Inner	0022135	79257	195	68
				67
				68
				69
				68
				68
				68
				67
				$\bar{X}$ = 67.9
				SD = 0.641
Inner	0022788	79275	183	61
				60
				61
				64
				59
				62
				59
				64
				$\bar{X}$ = 61.3
				SD = 1.982

TABLE 14

TCLE TEST DATA
77°F

Type Prop	Motor S/N	Test Date	Age at Test (mo)		Below Tg (in/in/°C)	Above Tg (in/in/°C)
Outer	0022135	79253	195		0.0000672	0.0001008
					0.0000716	0.0000988
					0.0000683	0.0001032
				$\overline{X}$ =	0.0000694	0.0001009
				SD =	0.000003	0.000002
Outer	0022788	79271	182		0.0000604	0.0000982
					0.0000609	0.0000973
					0.0000595	0.0001034
				$\overline{X}$ =	0.0000603	0.0000996
				SD =	0.0000007	0.000003
Inner	0022135	79253	195		0.0000704	0.0000985
					0.0000678	0.0001016
					0.0000704	0.0001019
				$\overline{X}$ =	0.0000695	0.0001007
				SD =	0.000002	0.000002
Inner	0022788	79271	182		0.0000679	0.0001002
					0.0000642	0.0001004
					0.0000663	0.0000989
				$\overline{X}$ =	0.0000661	0.0000998
				SD =	0.000002	0.0000008

TABLE 15

BOND CONSTANT LOAD TEST DATA

Motor S/N	Test Mode	Temp (°F)	Load (lbs)	Fail Time hr:min:sec	Failure Mode*
0022135	Tensile	77	36	5:23:00	adh L-P
				5:06:00	"
				4:47:00	"
		120	27½	1:45:00	adh L-P
				3:40:00	"
				0:25:54	"
				0:30:48	"
0022788	Tensile	77	32	0:21:45	P-int
				0:38:15	"
				0:16:30	"
		120	27½	0:01:16	P-int
				0:18:00	"
				0:45:00	"
0022135	Shear	77	73	2:42:00	P-int
				4:42:00	"
				8:42:00	
				2:10:00	
		120	53	4:02:00	Coh P
				3:30:00	"
				4:30:00	"
0022788	Shear	77	73	6:43:00	P-int
				5:40:00	"
				0:35:00	Coh P
		120	54	1:40:00	P-int
				0:04:00	Coh P
				1:41:00	P-int
				2:59:00	"

*Adh L-P = Adhesive liner to propellant bond failure
P - Int = Very thin amount of propellant left on liner
Coh - P = Cohesive propellant failure

TABLE 16

SOL GEL TEST DATA
$77^{o}F$, (non-oriented)

Outer Propellant

Motor S/N	Test Date	Age at Test (mo)	Gel Swell Ratio	Wt Swell Ratio	Mass Density (gm/cc)	Crosslink Density	% Extractables
0022135	79304	197	12.1047	3.8188	1.7515	0.02691	7.9616
			12.5709	3.3240	1.7511	0.03640	8.8777
			13.0846	3.4645	1.7508	0.03257	8.9130
		$\bar{X}$ =	12.5867	3.5358	1.7511	0.03196	8.5841
		SD =	0.49	0.25	0.0004	0.005	0.54
0022788	79304	185	11.7816	3.4655	1.7444	0.03598	8.3540
			13.0579	3.4877	1.7461	0.03167	8.9073
			10.0571	3.4782	1.7453	0.03004	7.2744
			12.8570	3.5093	1.7460	0.03438	8.7927
			12.8130	3.4776	1.7465	0.03094	8.8121
			12.9963	3.5059	1.7457	0.03094	8.8604
			13.1014	3.5302	1.7458	0.03094	8.8726
			12.9314	3.5168	1.7458	0.02892	8.8168
		$\bar{X}$ =	12.4495	3.4964	1.7457	0.03173	8.5863
		SD =	1.06	0.02	0.0006	0.002	0.56

Inner Propellant

Motor S/N	Test Date	Age at Test (mo)	Gel Swell Ratio	Wt Swell Ratio	Mass Density (gm/cc)	Crosslink Density	% Extractables
0022135	79304	197	11.5316	4.2175	1.7568	0.02380	7.0077
			11.1244	4.2367	1.7568	0.02690	6.7075
			11.7400	4.2149	1.7652	0.02690	7.0789
		$\bar{X}$ =	11.4653	4.2230	1.7596	0.02587	6.9314
		SD =	0.31	0.01	0.005	0.002	0.2
0022788	79304	185	10.9307	3.2418	1.7496	0.03967	8.1896
			10.7893	3.2532	1.7502	0.04298	8.0851
			10.8846	3.2324	1.7507	0.04550	8.1694
			10.5757	3.2256	1.7506	0.04298	7.9984
			11.0724	3.2557	1.7467	0.04298	8.2697
			10.8074	3.2546	1.7506	0.04126	8.0904
			10.7907	3.2441	1.7514	0.04618	8.0913
			10.8318	3.2498	1.7516	0.04181	8.1046
		$\bar{X}$ =	10.8353	3.2447	1.7502	0.04292	8.1248
		SD =	0.14	0.01	0.002	0.002	0.08

TABLE 17

REGRESSION SUMMARY
TEST RESULTS

Test	X-head Speed	20° Sm	20° er	20° E	77° Sm	77° er	77° E	120° Sm	120° er	120° E	160° Sm	160° er	160° E
Outer-Uniaxial	0.0002				NS	NS	NS				NS	NS	NS
Tensile	0.002				NS	NS	NS	NS	S+	S-			
	0.02				S+	NS	S+	S-	NS	NS			
	0.20	NS	S+	NS	NS	S+	NS						
	2.0	NS	NS	NS	S+	NS	NS						
	20.0	NS	NS	S+									
Outer-Low Rate	2.0	NS	NS	NS	S+	NS	NS						
Hydro, 500 psi	20.0	NS	NS	S+									
Outer-Hydro,500 psi	1750.0				S+	NS	S+						
Outer-Biaxial Tensile	0.0002							NS	NS	NS			
	0.002							S-	NS	NS			
	0.2				S-	NS	NS						
	2.0	NS	NS	NS	S-	NS	NS						
Outer-Triaxial Tensile													
500 psi	1750				S-	S+	S-						
Inner-Uniaxial Tensile	0.0002				S+	S-	S+	NS	NS	NS	NS	S-	S+
	0.002				NS	S-	NS	NS	NS	NS			
	0.02				S+	S-	S+	S+	S-	S+			
	0.2	NS	NS	NS	NS	NS	S+						
	2.0	NS	NS	S+	S+	NS	S+						
	20.0	S-	S-	S+									
Inner-LR Hydro Tensile	2.0	S+	NS	S+									
500 psi	20.0	S+	S-	S+									
Inner-Hydrostatic HR Tensile, 500 psi	1750				S+	S-	S+						
Inner-Biaxial Tensile	0.0002							NS	NS	NS			
	0.002							NS	NS	NS			
	0.2				NS	NS	NS						
	2.0	NS	NS	NS	NS	NS	NS						
Inner-Triaxial Tensile	1750				S-	S+	S-						
500 psi,													
Circumferential	0.0002				NS	NS	NS	S-	NS	S-			
	20.0	NS	S-	S+									
Bi-Propellant	0.0002				NS	NS	NS	S-	NS	NS			
	20.0	NS	NS	S+									
	0.2				S+	NS	S+						
	2.0	S+	NS	S+	S+	NS	S+						

TABLE 17 (cont)

Test	X-head Speed	Temperature 20°			77°			120°			160°		
		Sm	er	E	Sm	er	E	Sm	er	E	Sm	er	E
Tear Energy (outer)	0.01		NS			NS			NS			NS	
	0.1												
	1.0		NS			NS			NS			NS	
Tear Energy (inner)	0.01		NS			S+			S+			S+	
	0.1												
	1.0		NS			NS			S+			S+	

Test	Inner	Outer
Burn Rate, 500 psi	S+	S+
Hardness	S+	S-
TCLE (below)	S+	NS
(above)	S+	NS

NS = Not significant trend line slope

S+ = Significant trend line with a positive slope

S- = Significant trend line with a negative slope

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
99.0	8	+4.2762451E+01	+3.5542222E+00	+4.9399993E+01	+3.7399993E+01	+4.4194885E+01
100.0	8	+4.0774963E+01	+3.3464430E+00	+4.5699996E+01	+3.7299967E+01	+4.4194381E+01
113.0	8	+4.5162445E+01	+1.1908040E+00	+4.6799987E+01	+4.3399993E+01	+4.4187759E+01
116.0	4	+4.6349990E+01	+2.0461049E+00	+4.9319992E+01	+4.4789993E+01	+4.4186218E+01
122.0	4	+5.0449981E+01	+4.2289529E-01	+5.0979995E+01	+5.0049987E+01	+4.4183166E+01
129.0	4	+4.2197479E+01	+5.4090730E-01	+4.2939987E+01	+4.1739990E+01	+4.4179595E+01
130.0	3	+5.0593322E+01	+2.0044173E+00	+5.2309997E+01	+4.8389999E+01	+4.4179092E+01
136.0	3	+4.3469985E+01	+1.0813467E+00	+4.5409988E+01	+4.2429992E+01	+4.4176040E+01
144.0	3	+4.0719985E+01	+2.2230638E+00	+4.2250000E+01	+3.8169998E+01	+4.4171966E+01
149.0	3	+5.2136657E+01	+1.6726966E+00	+5.4039993E+01	+5.0899993E+01	+4.4169418E+01
155.0	3	+4.3533325E+01	+6.2732510E-01	+4.4099990E+01	+4.2859985E+01	+4.4166351E+01
165.0	3	+3.9676651E+01	+2.8116620E+00	+4.2189987E+01	+3.6639999E+01	+4.4161254E+01
178.0	3	+4.0623321E+01	+2.0904430E+00	+4.3029998E+01	+3.9259994E+01	+4.4154632E+01
183.0	3	+4.4926651E+01	+1.8689485E+00	+4.6649993E+01	+4.2939987E+01	+4.4152084E+01
197.0	3	+4.3536651E+01	+5.5831569E+00	+4.8019989E+01	+3.7279998E+01	+4.4144958E+01

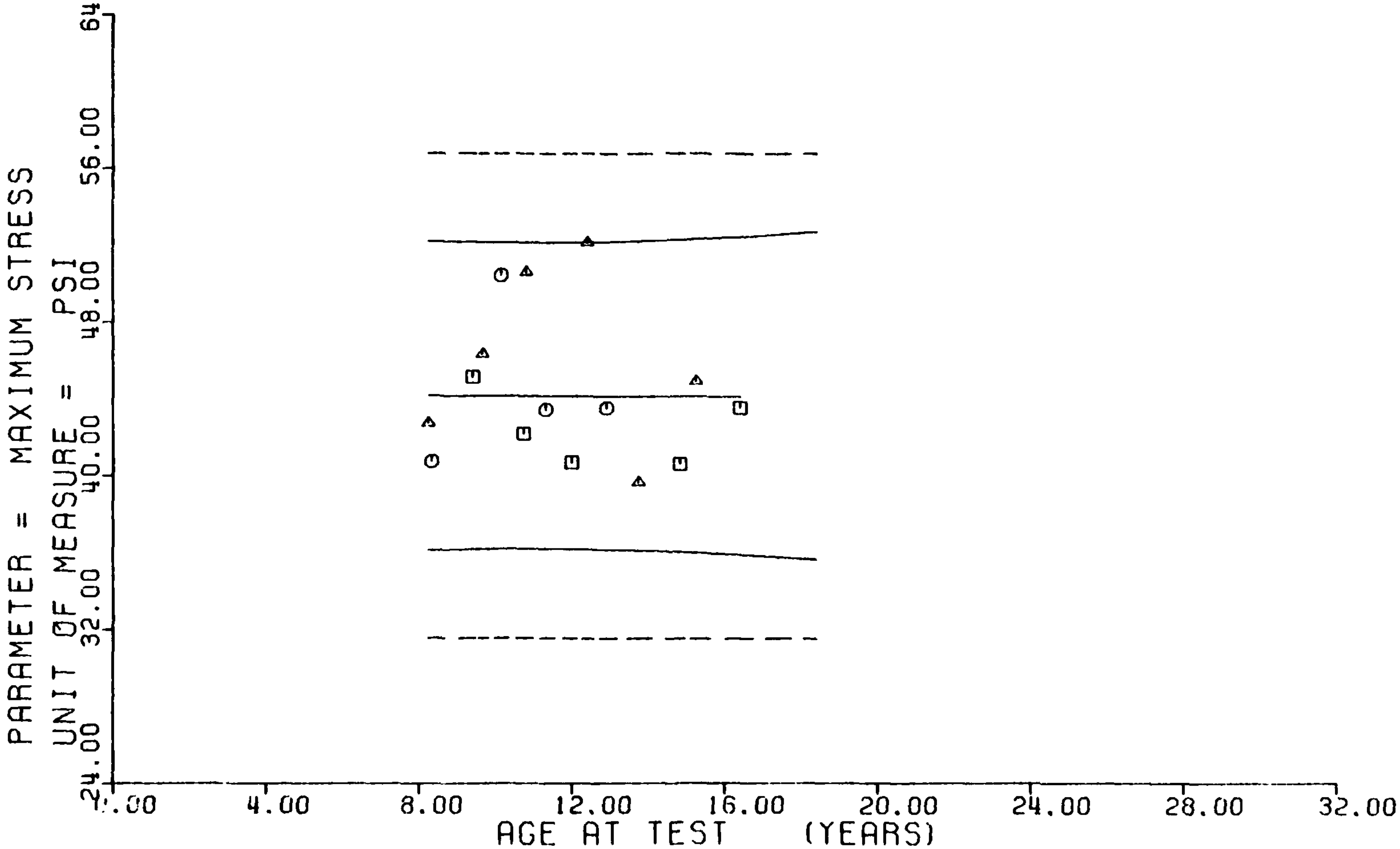
II STAGE DSCT MIRS.OUTER.AXIAL PDS.V.L.RATE CHS=0.0002 IN/MIN.MAXIMUM STRESS

THIS SAMPLE SIZE SUMMARY IS APPLICABLE TO FIGURES 4 THRU 9

Y = ((+4.4245328E+01) + (-5.0945226E-04) * X)

F = +7.9799832E-04   SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y = +4.1670776E+00
R = -3.6168727E-03   SIGNIFICANCE OF R = NOT SIGNIFICANT S_B = +1.8034433E-02
ι = +2.8248864E-02   SIGNIFICANCE OF ι = NOT SIGNIFICANT S_E = +4.2010676E+00
N = 63   DEGREES OF FREEDOM = 61

STORAGE CONDITIONS = AMB TEMP/RH   TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTRS, OUTER, AXIAL POS, V.L. RATE CHS=0.0002 IN/MIN, MAXIMUM STRESS

Figure 4

Y = ((+2.2869516E-01) + (-1.4419276E-04) * X)

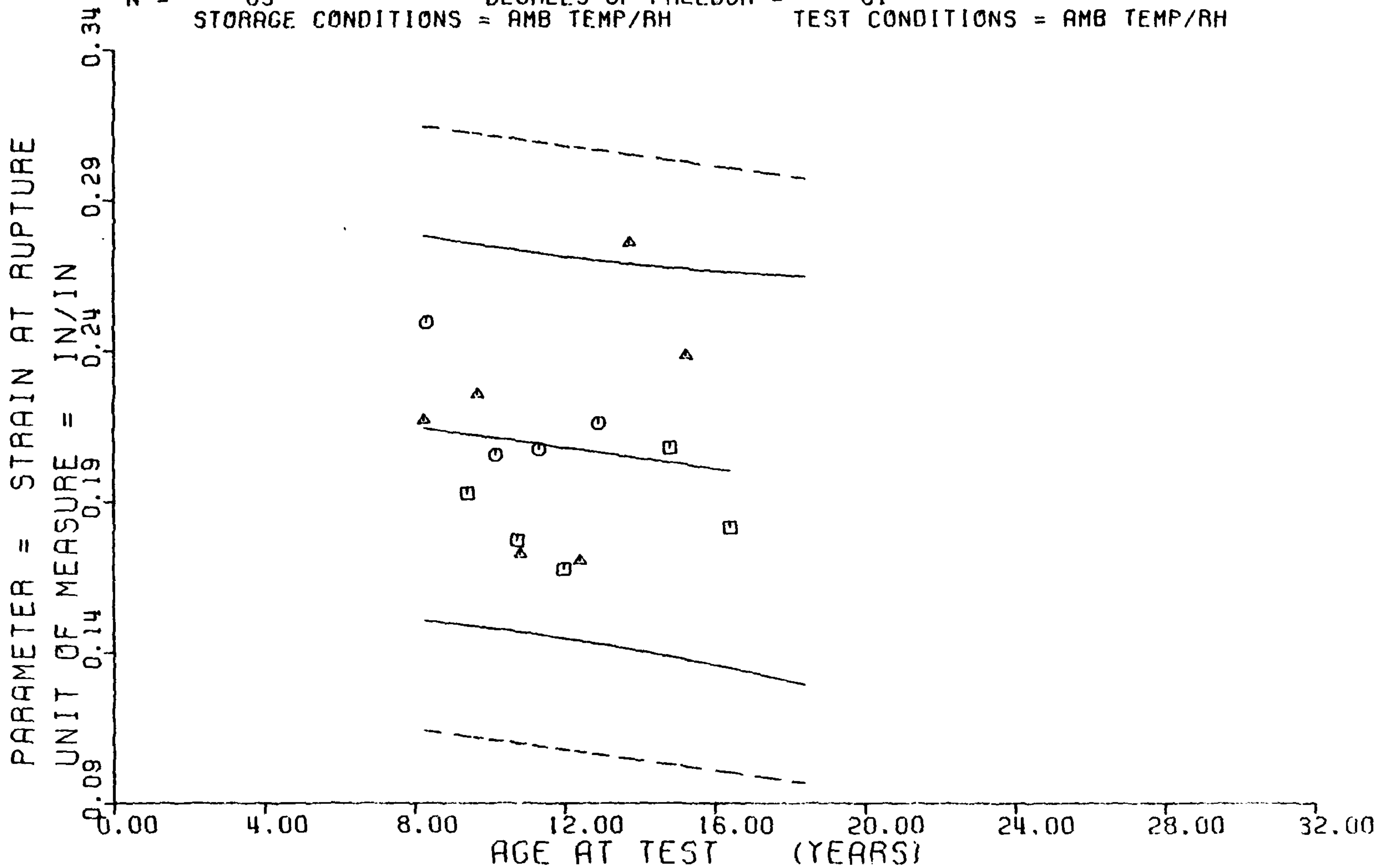
F = +1.0109424E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y = +3.3409945E-02

R = -1.2768181E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT S_a = +1.4341027E-04

ι = +1.0054563E+00 SIGNIFICANCE OF ι = NOT SIGNIFICANT S_ε = +3.3406997E-02

N = 63 DEGREES OF FREEDOM = 61

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTRS,OUTER,AXIAL POS,V.L.RATE CHS=0.0002 IN/MIN,STRAIN/RUPTURE

Figure 5

Y = ((+3.6327237E+02) + (+6.2095527E-02) * X)

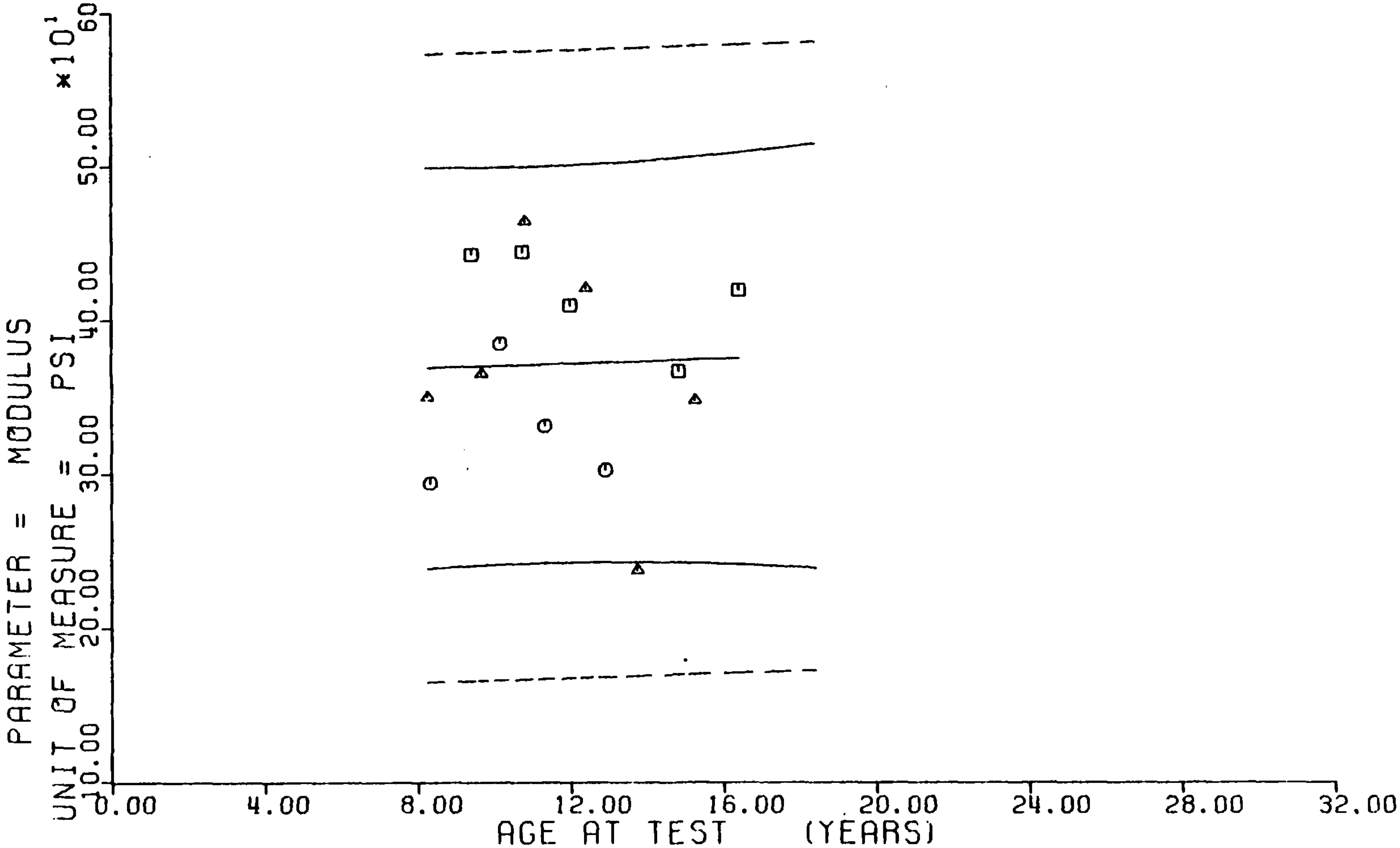
F = +4.5129183E-02   SIGNIFICANCE OF F = NOT SIGNIFICANT σ_T = +6.7564476E+01

R = +2.7189625E-02   SIGNIFICANCE OF R = NOT SIGNIFICANT S_a = +2.9230186E-01

ι = +2.1243630E-01   SIGNIFICANCE OF ι = NOT SIGNIFICANT S_ι = +6.8090849E+01

N = 63   DEGREES OF FREEDOM = 61

STORAGE CONDITIONS = AMB TEMP/RH   TEST CONDITIONS = AMB TEMP/RH



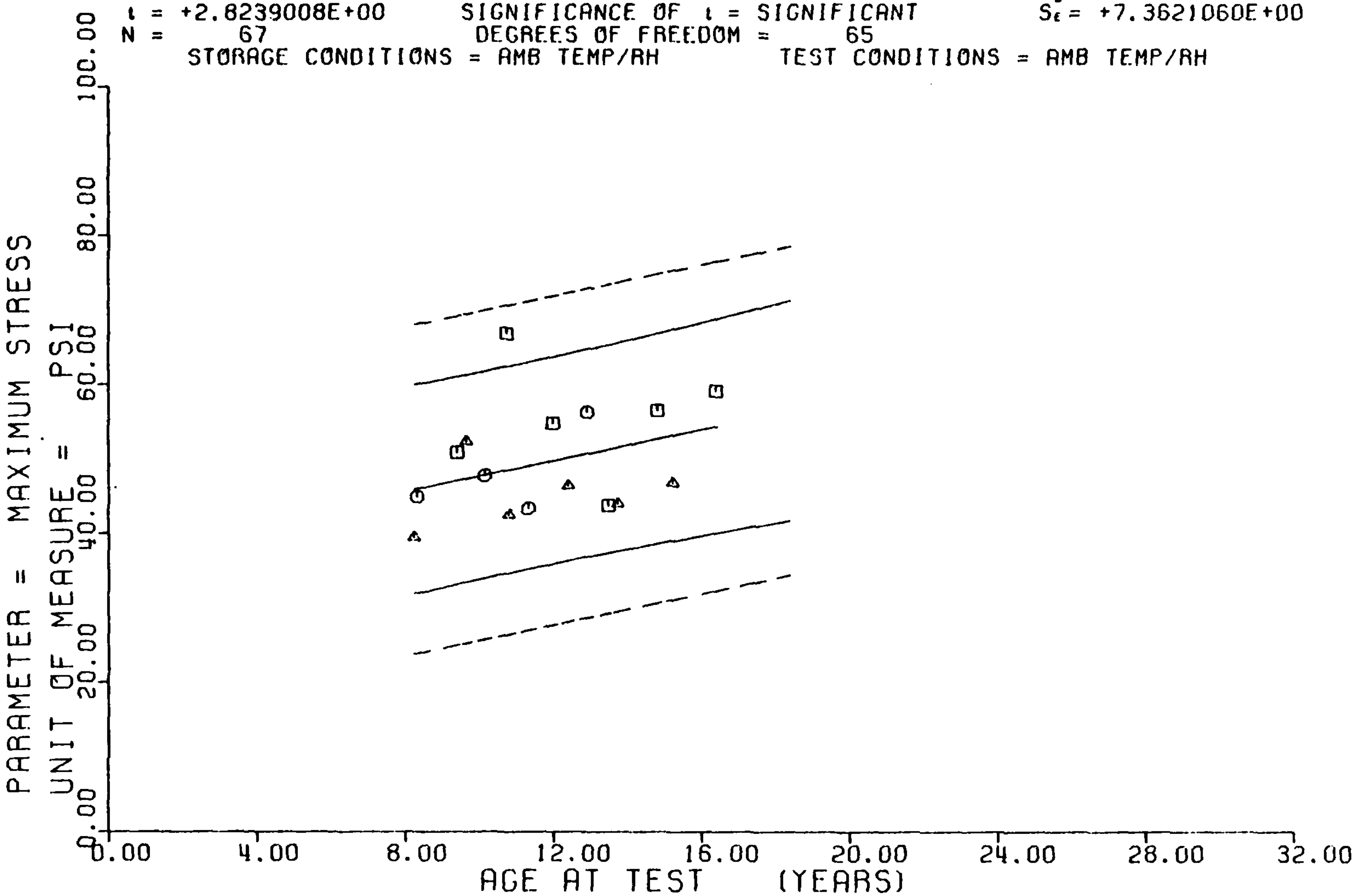
II STAGE DSCT MTRS,OUTER,AXIAL POS,V.L.RATE CHS=0.0002 IN/MIN, MODULUS

Figure 6

Y = ((+3.7305888E+01) + (+8.6476014E-02) * X)

F = +7.9744158E+00 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +7.7413270E+00
R = +3.3057052E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +3.0622893E-02
t = +2.8239008E+00 SIGNIFICANCE OF t = SIGNIFICANT S_ε = +7.3621060E+00
N = 67 DEGREES OF FREEDOM = 65

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE OSCT MTRS, INNER, AXIAL POS, V.L.RATE CHS=0.0002 IN/MIN, MAXIMUM STRESS

Figure 7

Y = ((+4.8040088E-01) + (-9.8841859E-04) * X)

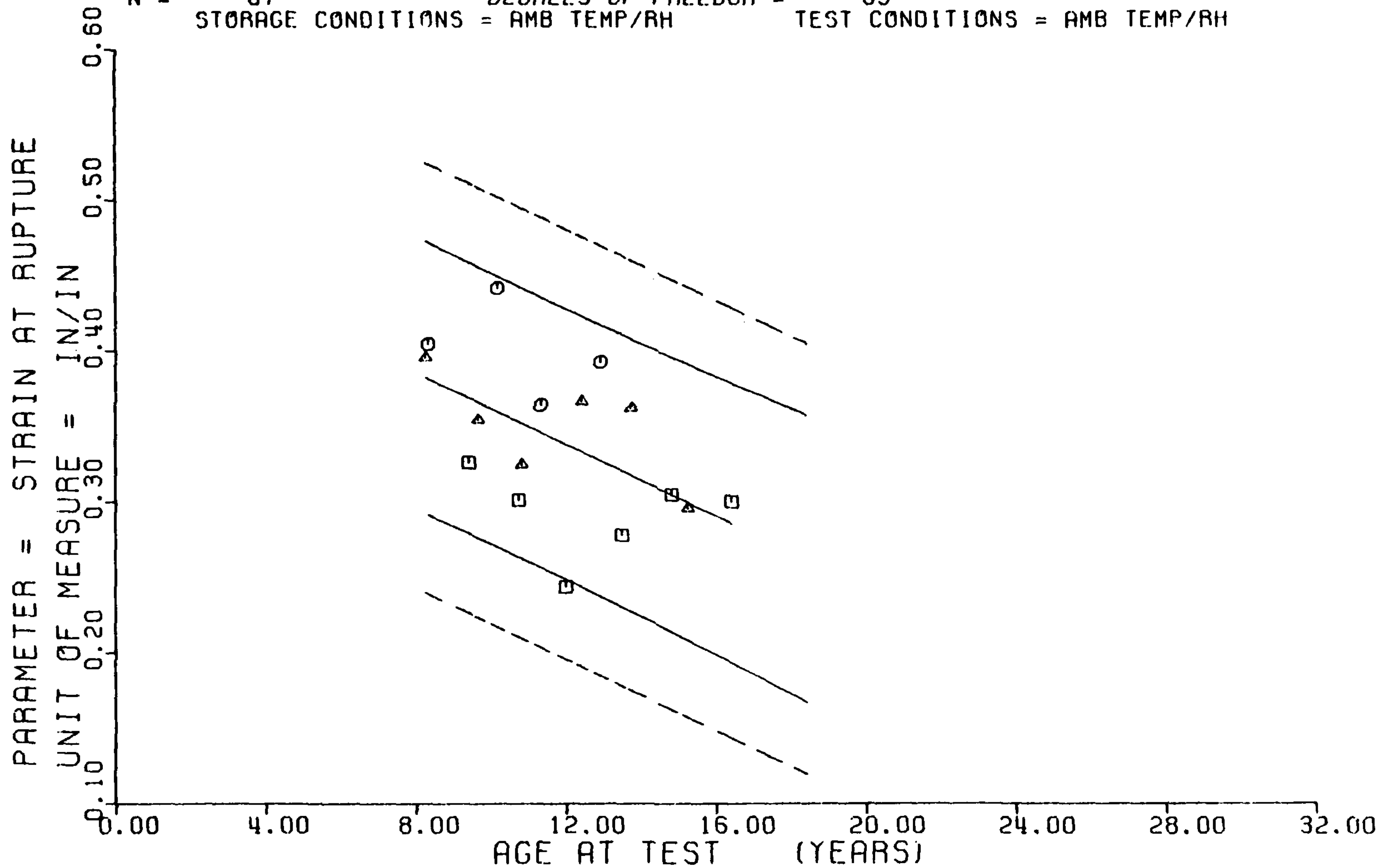
F = +2.5032900E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +5.5471487E-02

R = -5.2729659E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +1.9755376E-04

t = +5.0032889E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +4.7494263E-02

N = 67 DEGREES OF FREEDOM = 65

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTRS, INNER, AXIAL POS, V.L. RATE CHS=0.0002 IN/MIN, STRAIN/RUPTURE

Figure 8

Y = ((+1.2736652E+02) + (+9.7079940E-01) * X)

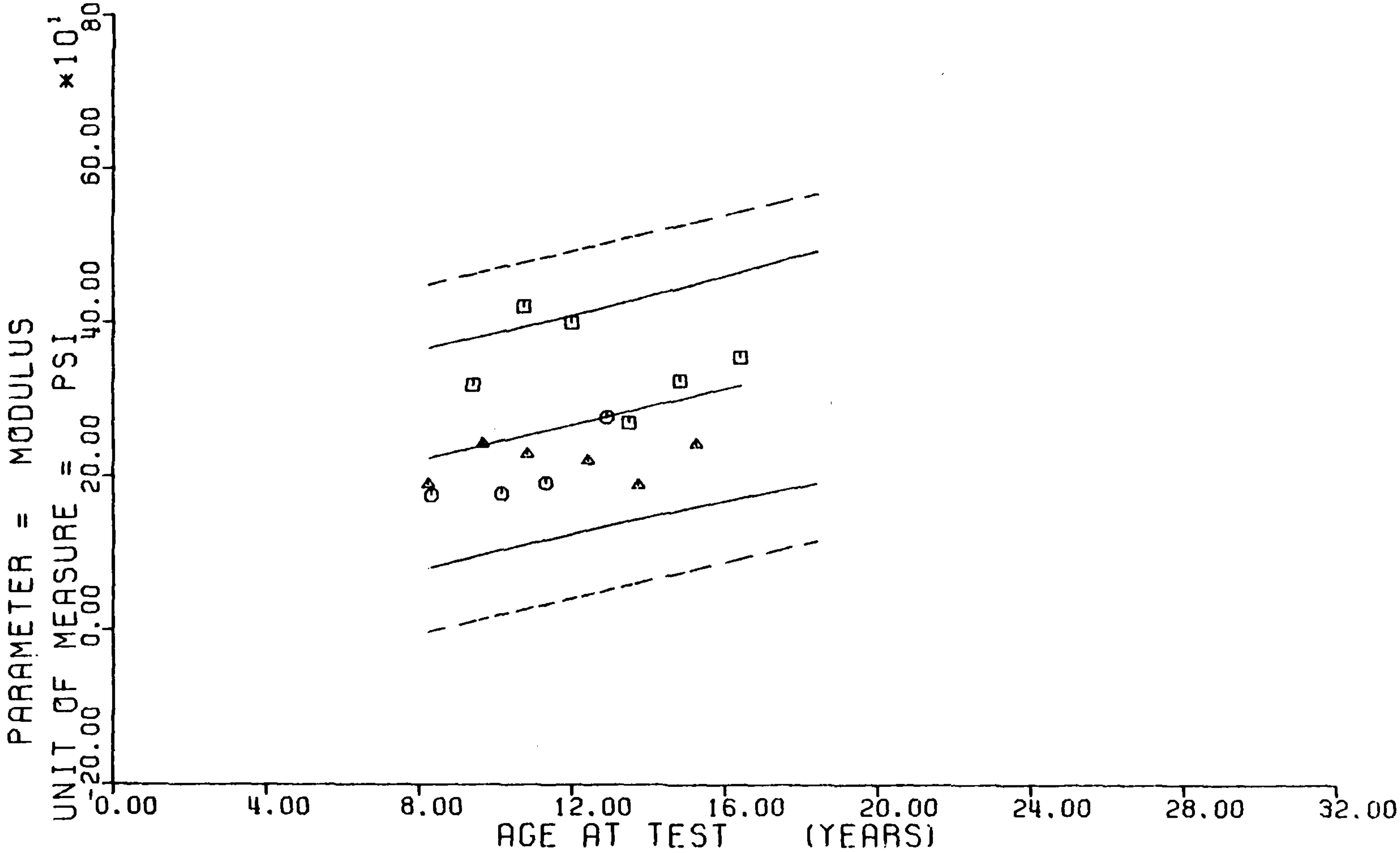
F = +9.6261828E+00 SIGNIFICANCE OF F = SIGNIFICANT σ_T = +7.9989308E+01

R = +3.5915460E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +3.1289775E-01

t = +3.1026090E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +7.5224324E+01

N = 67 DEGREES OF FREEDOM = 65

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE OSCT MTRS, INNER, AXIAL POS, V.L. RATE CHS=0.0002 IN/MIN, MODULUS

Figure 9

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
100.0	16	+9.5937500E+01	+1.4172596E+01	+1.1500000E+02	+8.0000000E+01	+1.1080606E+02
113.0	8	+1.2962500E+02	+3.9256482E+00	+1.3500000E+02	+1.2300000E+02	+1.1278010E+02
115.0	4	+1.2783996E+02	+1.2918889E+00	+1.2962998E+02	+1.2666999E+02	+1.1308380E+02
122.0	4	+1.2726489E+02	+1.2451648E+00	+1.2857998E+02	+1.2614999E+02	+1.1414675E+02
129.0	4	+1.2971240E+02	+8.4571722E-01	+1.3075000E+02	+1.2903999E+02	+1.1520970E+02
131.0	3	+1.2301992E+02	+7.1236251E-01	+1.2377999E+02	+1.2240998E+02	+1.1551339E+02
137.0	3	+1.0322329E+02	+2.1904902E+00	+1.0519999E+02	+1.0086999E+02	+1.1642449E+02
143.0	4	+1.0432495E+02	+9.7243835E+00	+1.1617999E+02	+9.4009994E+01	+1.1733560E+02
148.0	3	+1.2969985E+02	+2.6765109E+00	+1.3144999E+02	+1.2662998E+02	+1.1809484E+02
155.0	3	+1.4210993E+02	+8.1295019E+00	+1.5122999E+02	+1.3562998E+02	+1.1915779E+02
161.0	3	+1.1301660E+02	+1.7623937E+00	+1.1472999E+02	+1.1121998E+02	+1.2006889E+02
165.0	3	+1.1080664E+02	+7.2316964E+00	+1.2160998E+02	+1.0848999E+02	+1.2067628E+02
177.0	2	+1.1819499E+02	+9.9657917E-01	+1.1889999E+02	+1.1748999E+02	+1.2249848E+02
183.0	3	+1.1125991E+02	+6.7800516E-01	+1.1188999E+02	+1.1056999E+02	+1.2340957E+02
195.0	3	+1.1753327E+02	+2.9695596E+00	+1.2029998E+02	+1.1439999E+02	+1.2523178E+02

11 STAGE DSCT MTRS ONLY, OUTER,AXIAL POS.LOW RATE CHS=2.0 IN/MIN,MAX STRESS

This sample size summary is applicable to figures 10 thru 15

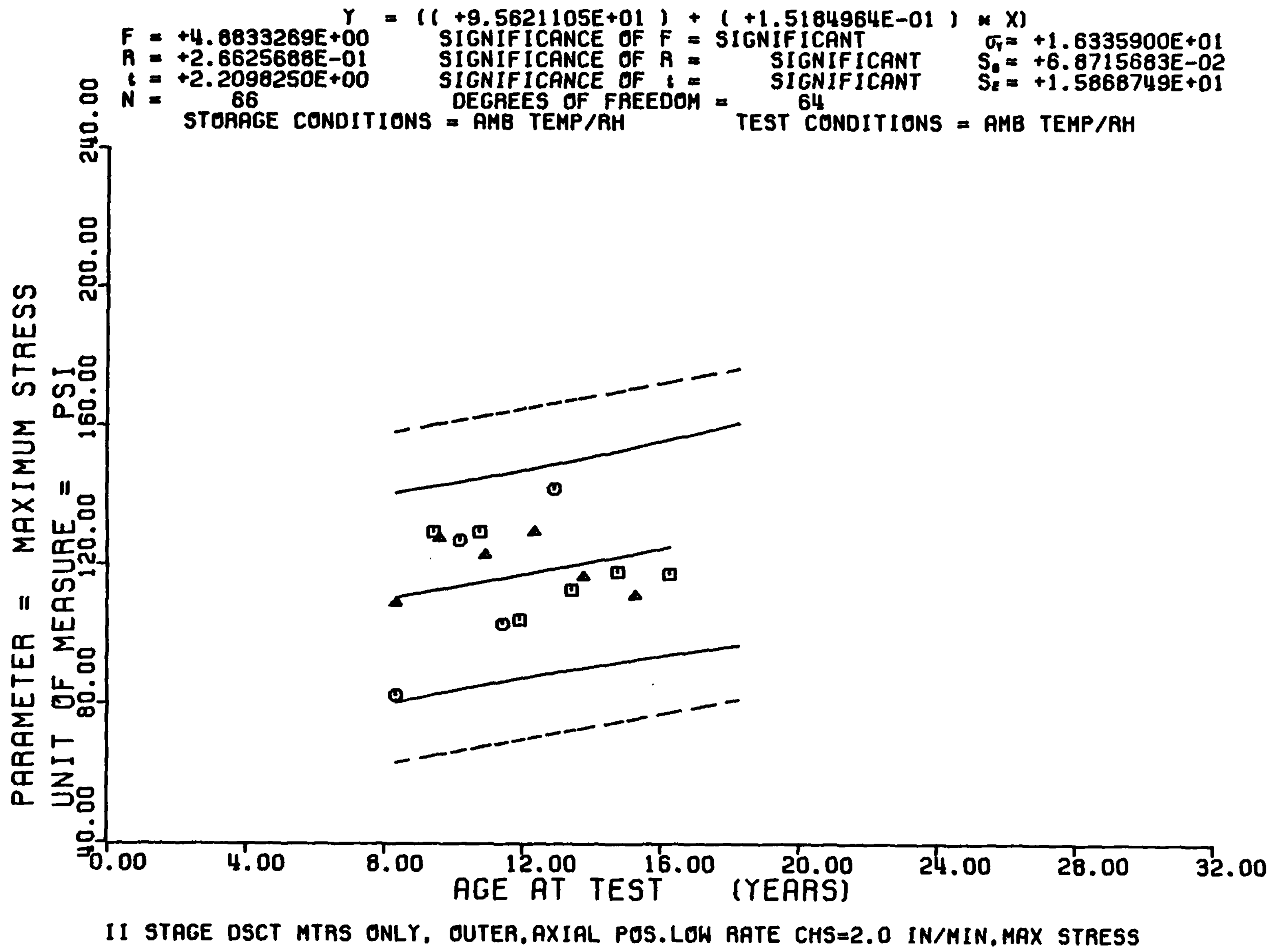

Y = ((+9.5621105E+01) + (+1.5184964E-01) * X)
F = +4.8833269E+00 SIGNIFICANCE OF F = SIGNIFICANT σY= +1.6335900E+01
R = +2.6625688E-01 SIGNIFICANCE OF R = SIGNIFICANT SB= +6.8715683E-02
t = +2.2098250E+00 SIGNIFICANCE OF t = SIGNIFICANT SE= +1.5868749E+01
N = 66 DEGREES OF FREEDOM = 64
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = MAXIMUM STRESS
UNIT OF MEASURE = PSI
40.00
80.00
120.00
160.00
200.00
240.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
II STAGE DSCT MTRS ONLY, OUTER,AXIAL POS.LOW RATE CHS=2.0 IN/MIN,MAX STRESS

Figure 10

Y = ((+4.4719749E-01) + (+2.4889472E-04) * X)

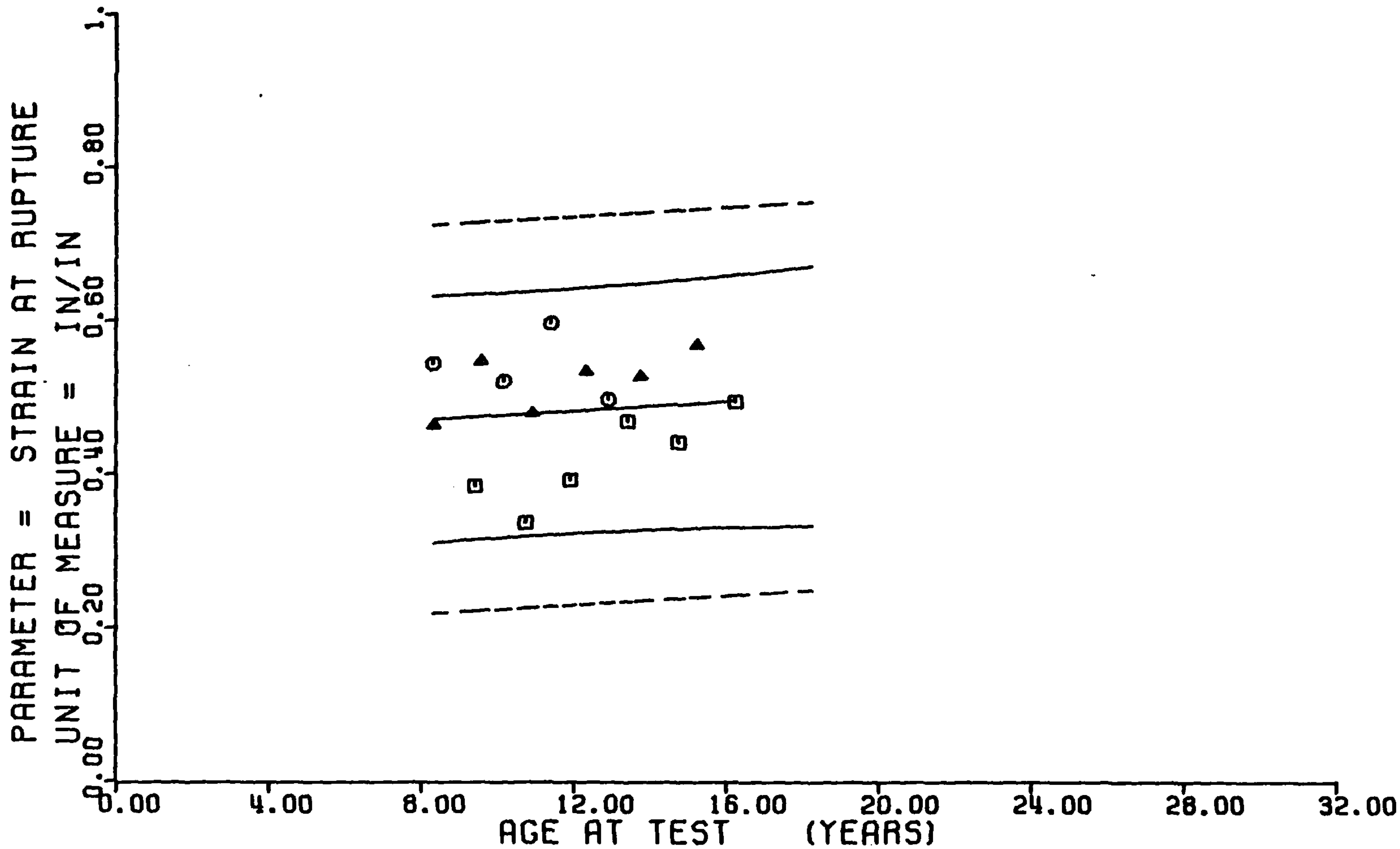
F = +4.8207651E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y = +8.3979047E-02

R = +8.5801872E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT S_B = +3.5847404E-04

t = +6.9431729E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT S_E = +8.4310504E-02

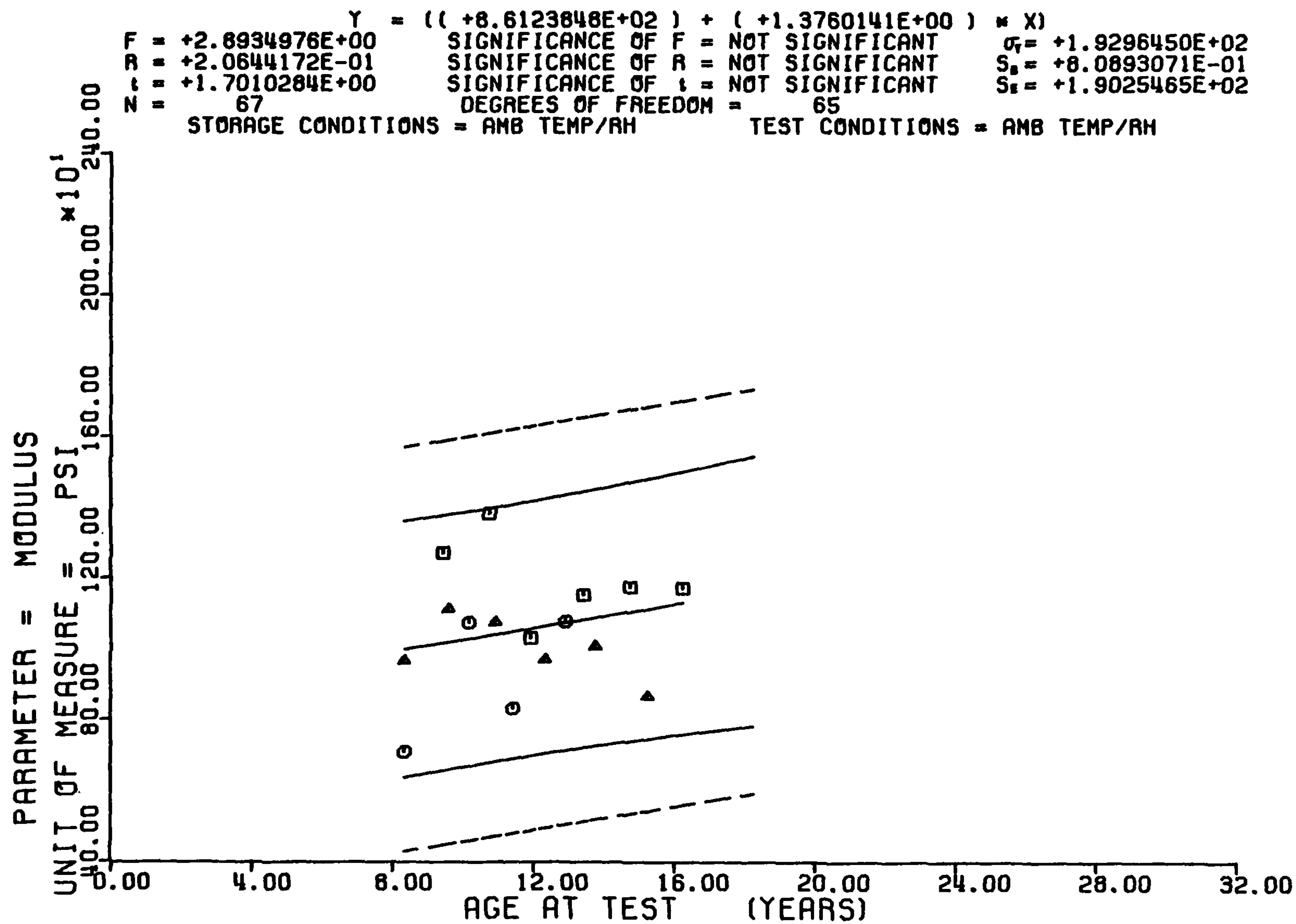
N = 67 DEGREES OF FREEDOM = 65

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTRS ONLY, OUTER,AXIAL POS.LOW RATE CHS=2.0 IN/MIN,STRAIN/RUPTURE

Figure 11



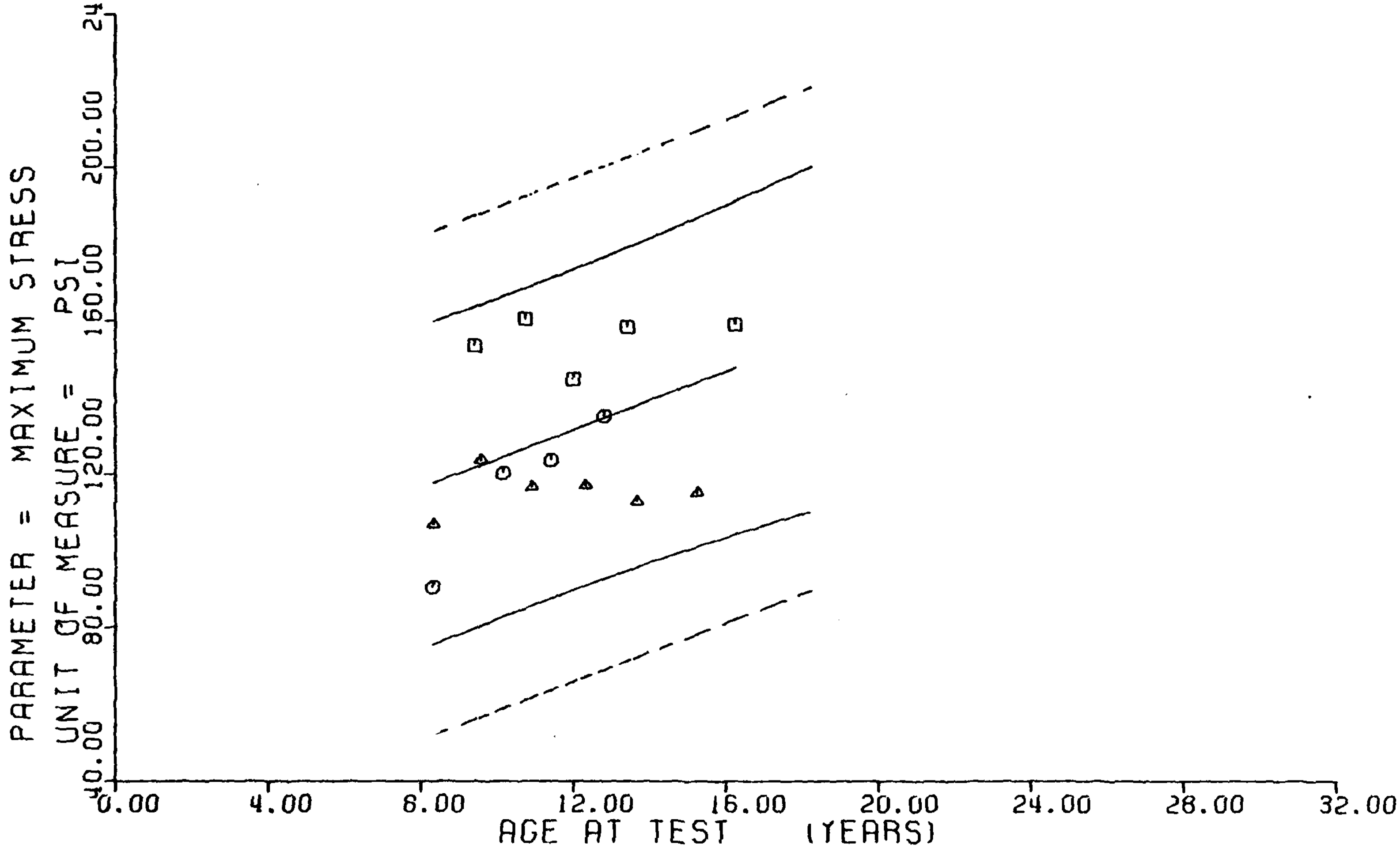
II STAGE DSCT MTRS ONLY, OUTER.AXIAL POS.LOW RATE CHS=2.0 IN/MIN, MODULUS

Figure 12

Y = ((+8.5911324E+01) + (+3.1742445E-01) * X)

F = +9.4146595E+00   SIGNIFICANCE OF F = SIGNIFICANT σ_1 = +2.3427539E+01
R = +3.7650607E-01   SIGNIFICANCE OF R = SIGNIFICANT S_2 = +1.0345070E-01
t = +3.0683643E+00   SIGNIFICANCE OF t = SIGNIFICANT S_e = +2.1893140E+01
N = 59   DEGREES OF FREEDOM = 57

STORAGE CONDITIONS = AMB TEMP/RH   TEST CONDITIONS = AMB TEMP/RH



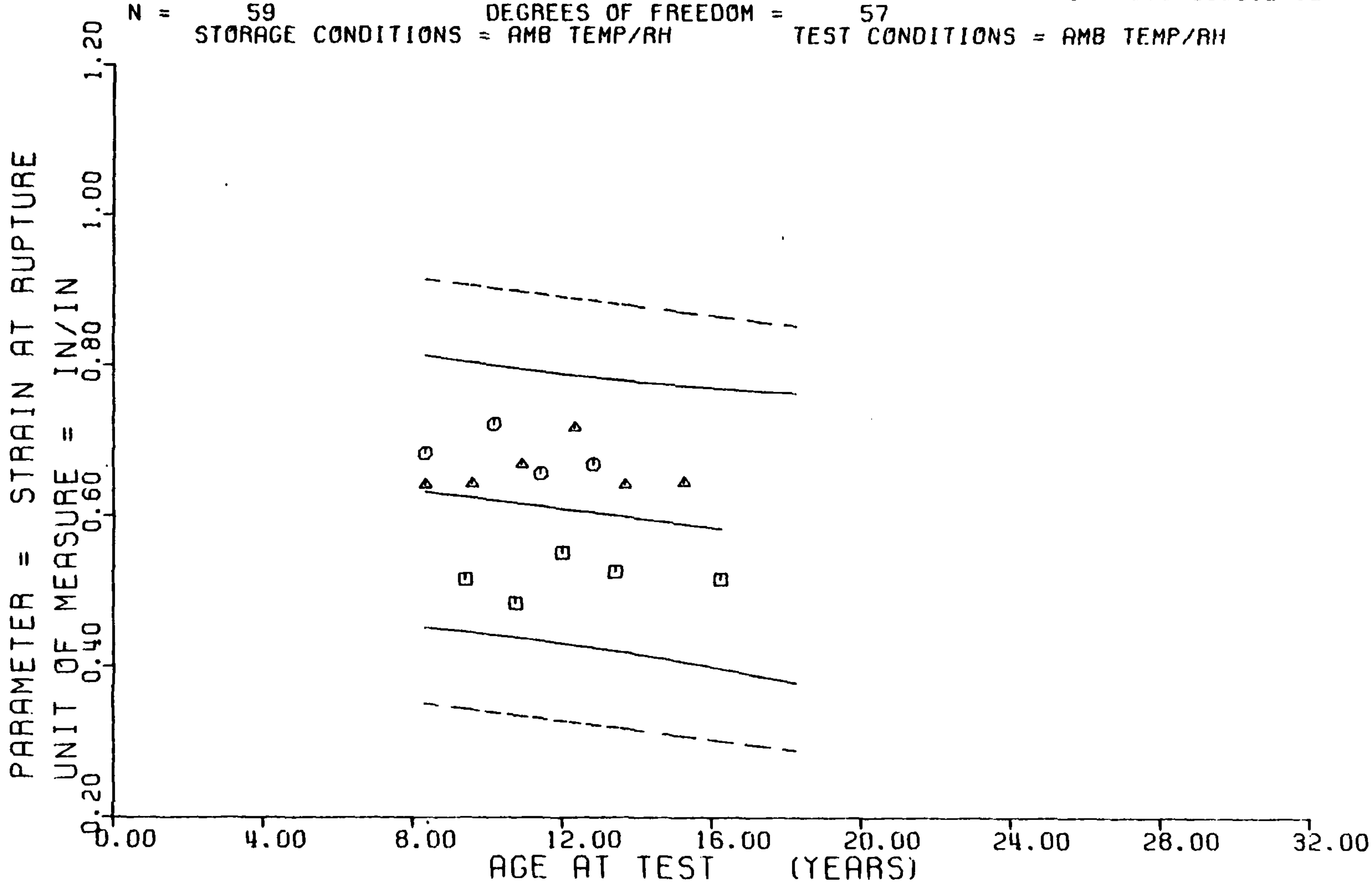
II STAGE,DSCT MTRS,ONLY, INNER,AXIAL POS.LOW RATE CHS=2.0 IN/MIN,MAX STRESS

Figure 13

$Y = ((+6.8543238E-01) + (-5.2238273E-04) * X)$

F = +1.3841560E+00	SIGNIFICANCE OF F = NOT SIGNIFICANT	σ_Y = +9.4276703E-02
R = -1.5397315E-01	SIGNIFICANCE OF R = NOT SIGNIFICANT	S_B = +4.4401362E-04
ι = +1.1765015E+00	SIGNIFICANCE OF ι = NOT SIGNIFICANT	S_E = +9.3966031E-02
N = 59	DEGREES OF FREEDOM = 57	

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE,DSCT MTRS,ONLY, INNER,AXIAL POS.LOW RATE CHS=2.0 IN/MIN,STRAIN/RUPTURE

Figure 14

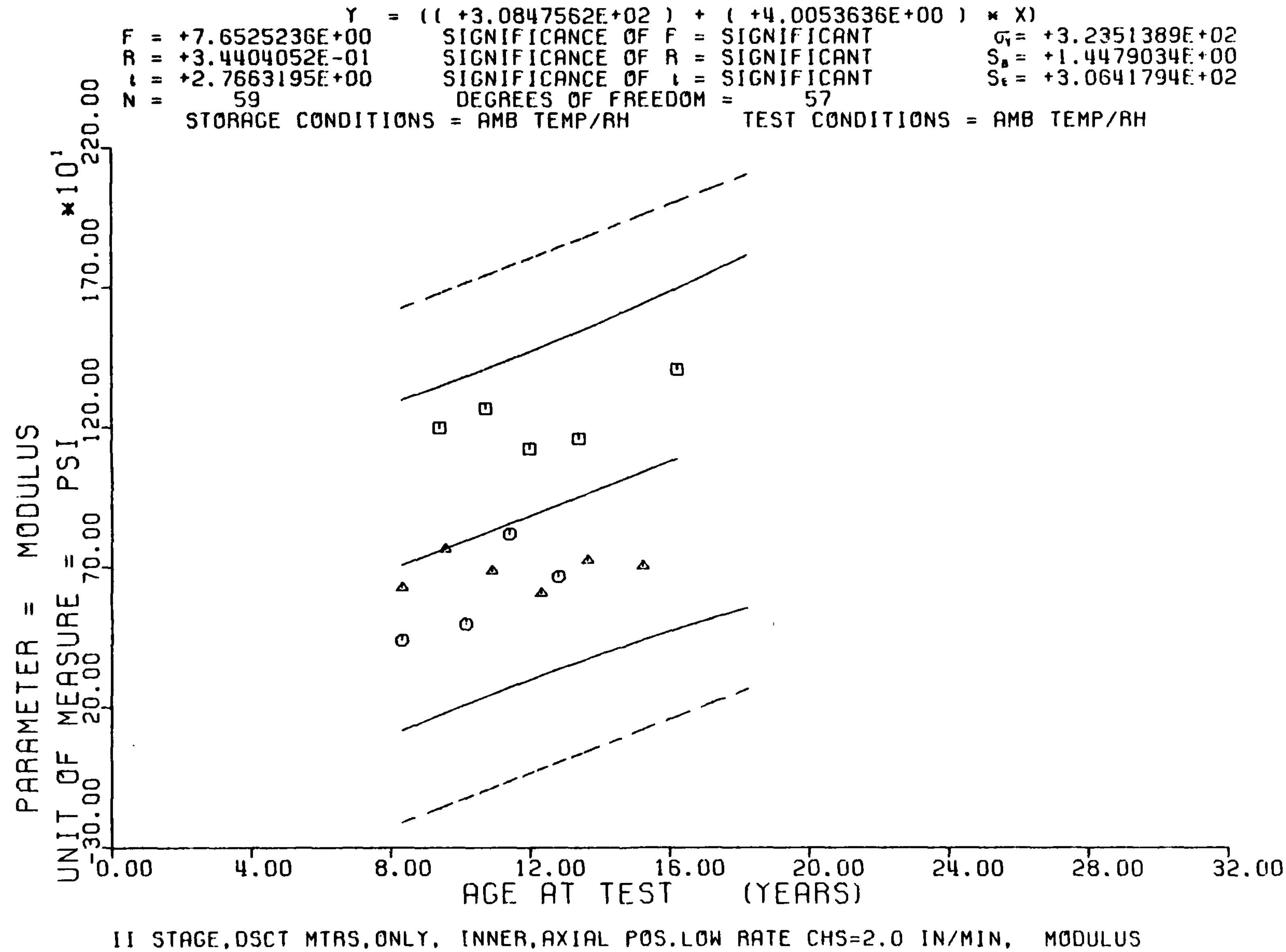

Y = ((+3.0847562E+02) + (+4.0053636E+00) * X)
F = +7.6525236E+00 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +3.2351389E+02
R = +3.4404052E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +1.4479034E+00
t = +2.7663195E+00 SIGNIFICANCE OF t = SIGNIFICANT S_t = +3.0641794E+02
N = 59 DEGREES OF FREEDOM = 57
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = MODULUS
UNIT OF MEASURE = PSI
*10^1
220.00
170.00
120.00
70.00
20.00
-30.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
II STAGE,DSCT MTRS,ONLY, INNER,AXIAL POS.LOW RATE CHS=2.0 IN/MIN, MODULUS

Figure 15

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
130.0	2	+3.8365966E+02	+8.3452689E+00	+3.8954980E+02	+3.7776977E+02	+3.4138940E+02
136.0	2	+3.5465991E+02	+7.2028456E+00	+3.5975000E+02	+3.4956982E+02	+3.4499584E+02
143.0	2	+4.0384472E+02	+2.4726434E+00	+4.0556982E+02	+4.0211987E+02	+3.4920312E+02
148.0	2	+3.9233471E+02	+8.4888704E+00	+3.9832983E+02	+3.8633984E+02	+3.5220849E+02
155.0	3	+1.8037988E+02	+3.0036336E+00	+1.8376998E+02	+1.7805999E+02	+3.5641601E+02
161.0	2	+3.8767480E+02	+4.5950872E+00	+3.9091992E+02	+3.8442993E+02	+3.6002221E+02
164.0	2	+4.0612988E+02	+1.3764958E+01	+4.1585986E+02	+3.9639990E+02	+3.6182543E+02
177.0	2	+4.0014477E+02	+4.6967618E+00	+4.0345996E+02	+3.9682983E+02	+3.6963916E+02
183.0	3	+3.5404321E+02	+7.5753490E-01	+3.5479980E+02	+3.5337988E+02	+3.7324560E+02
195.0	3	+4.0958642E+02	+5.5020698E+01	+4.4575976E+02	+3.4626977E+02	+3.8045849E+02

II STAGE OSCT MTR.2-IN G.L.BI-PROP.CHS=20 IN/MIN.T/TEMP=020 DEG(F).MAX STRESS

This sample size summary is applicable to figures 16 thru 18

Y = ((+2.6325144E+02) + (+6.0106179E-01) * X)

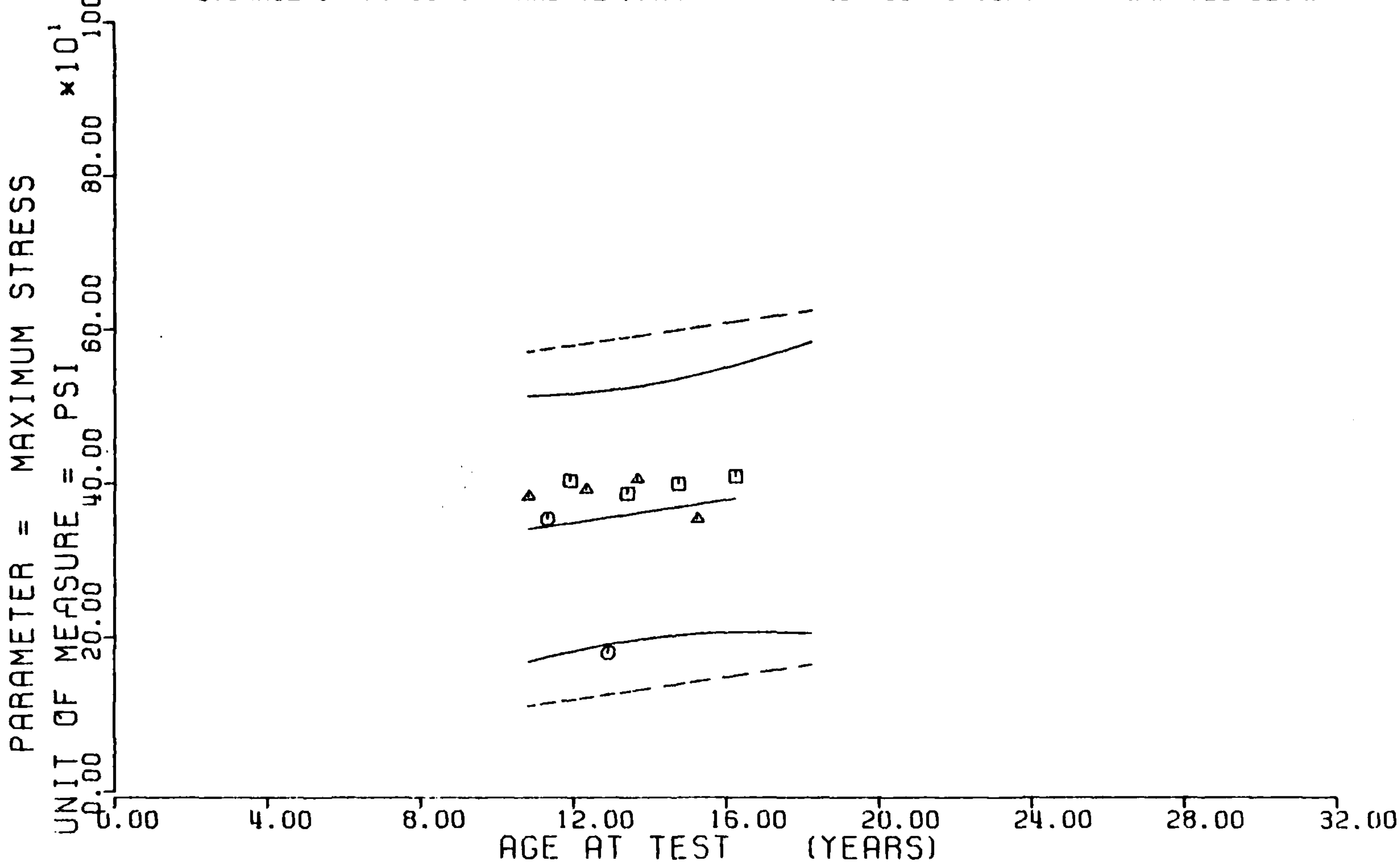
F = +5.9687255E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y = +7.5947874E+01

R = +1.6624376E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT S_B = +7.7799771E-01

t = +7.7257527E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT S_ε = +7.6653419E+01

N = 23 DEGREES OF FREEDOM = 21

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = T/TEMP=020 DEG(F



II STAGE DSCT MTR,2-IN G.L,BI-PROP,CHS=20 IN/MIN,T/TEMP=020 DEG(F),MAX STRESS

Figure 16

Y = ((+4.4832158E-01) + (-9.3139533E-04) * X)

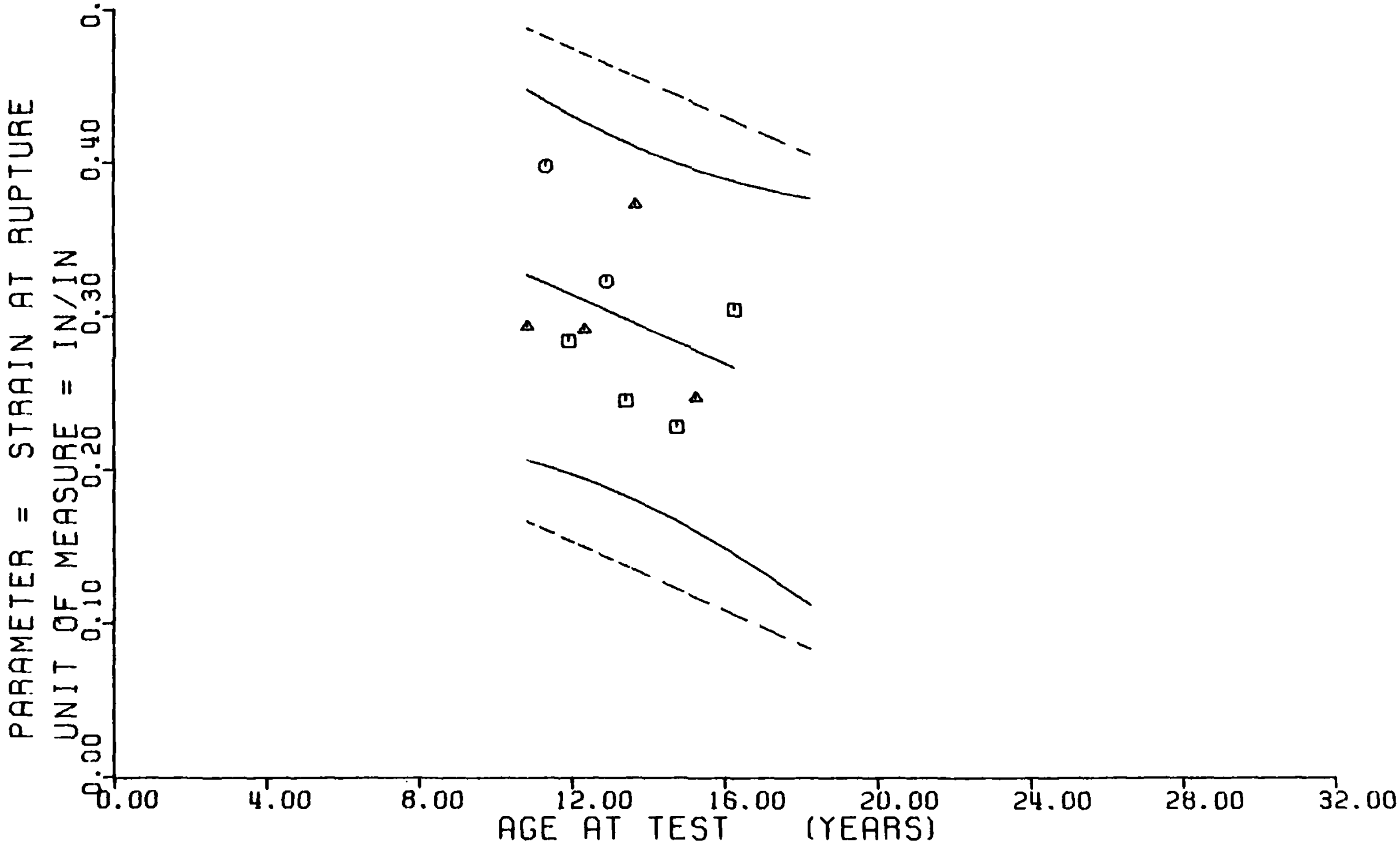
F = +2.9386730E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y = +5.5840633E-02

R = -3.5036893E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT S_B = +5.4332342E-04

t = +1.7142558E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT S_E = +5.3531774E-02

N = 23 DEGREES OF FREEDOM = 21

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = T/TEMP=020 DEG(F



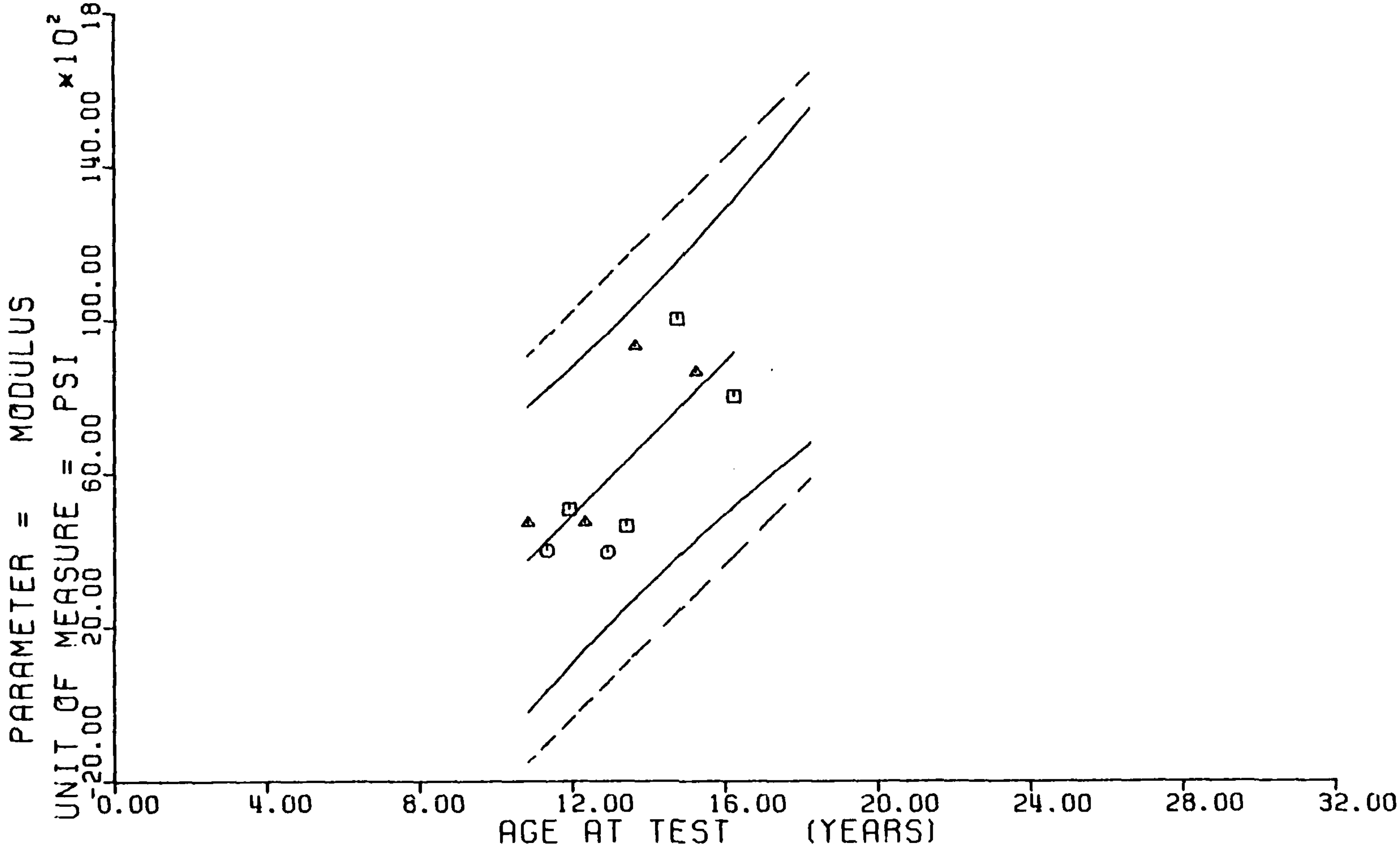
II STAGE DSCT MTR,2-IN G.L,BI-PROP,CHS=20 IN/MIN,T/TEMP=020 DEG(F),STRN/RUPT

Figure 17

$Y = ((-7.0259410E+03) + (+8.2985645E+01) * X)$

F = +2.1536979E+01	SIGNIFICANCE OF F = SIGNIFICANT	σ_Y = +2.4498290E+03
R = +7.1155597E-01	SIGNIFICANCE OF R = SIGNIFICANT	S_B = +1.7881773E+01
ι = +4.6407950E+00	SIGNIFICANCE OF ι = SIGNIFICANT	S_E = +1.7618291E+03
N = 23	DEGREES OF FREEDOM = 21	

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = T/TEMP=020 DEG(F



II STAGE DSCT MTR,2-IN G.L,BI-PROP,CHS=20 IN/MIN,T/TEMP=020 DEG(F),MODULUS

Figure 18

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
130.0	3	+1.1368662E+02	+9.7965671E-01	+1.1476998E+02	+1.1283999E+02	+1.0314964E+02
136.0	3	+9.5599929E+01	+3.1650804E+00	+9.9169998E+01	+9.3149993E+01	+1.0176626E+02
145.0	3	+9.3756591E+01	+2.5700148E+00	+9.6269989E+01	+9.1139999E+01	+9.9691192E+01
148.0	2	+1.0618499E+02	+4.6854464E+00	+1.0963999E+02	+1.0272999E+02	+9.8999511E+01
155.0	3	+9.3219970E+01	+4.9267017E+00	+9.6449996E+01	+8.7549987E+01	+9.7385559E+01
161.0	3	+9.3129959E+01	+7.7975986E+00	+1.0102999E+02	+8.5439987E+01	+9.6002182E+01
165.0	3	+9.4476638E+01	+3.5351937E+00	+9.7849990E+01	+9.0799987E+01	+9.5079940E+01
178.0	3	+9.1876617E+01	+1.9199557E+00	+9.3579986E+01	+8.9799987E+01	+9.2082611E+01
183.0	3	+9.2876617E+01	+1.9748469E+00	+9.5129989E+01	+9.1459991E+01	+9.0929809E+01
195.0	3	+9.0636627E+01	+6.7600347E-01	+9.1339996E+01	+9.0000000E+01	+8.8163055E+01

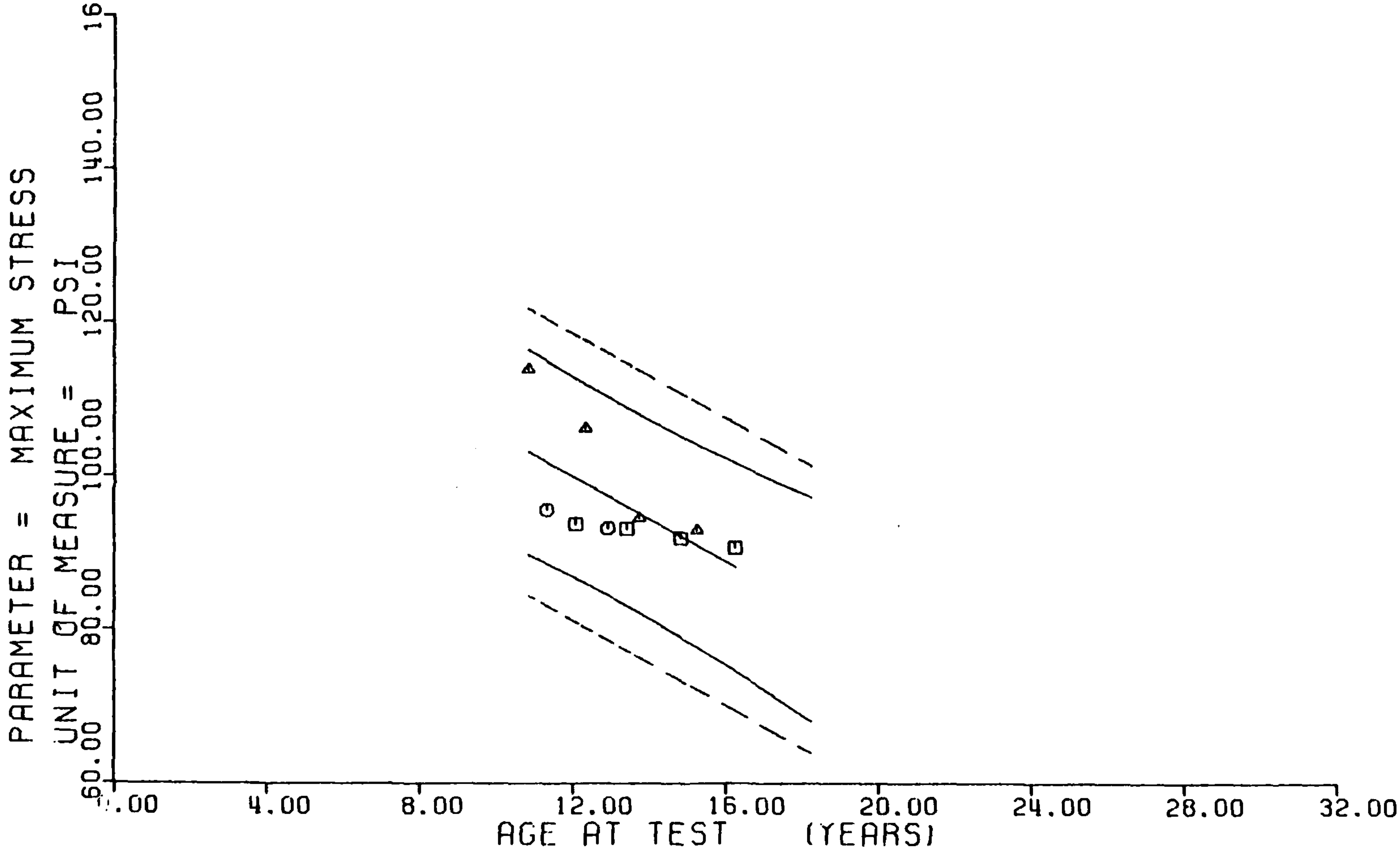
II STAGE DSCT MIRS ONLY.OUTER.AXIAL POS.BIAXIAL CHS=0.2 IN/MIN.MAXIMUM STRESS

This sample size summary is applicable to figures 19 thru 21

Y = ((+1.3312282E+02) + (-2.3056291E-01) * X)

F = +1.6150747E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +7.7293692E+00
R = -6.1178969E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +5.7371094E-02
ι = +4.0187993E+00 SIGNIFICANCE OF ι = SIGNIFICANT S_E = +6.2262837E+00
N = 29 DEGREES OF FREEDOM = 27

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTRS ONLY,OUTER,AXIAL POS.BIAXIAL CHS=0.2 IN/MIN,MAXIMUM STRESS

Figure 19

Y = ((+3.2104910E-01) + (+2.5089998E-04) * X)

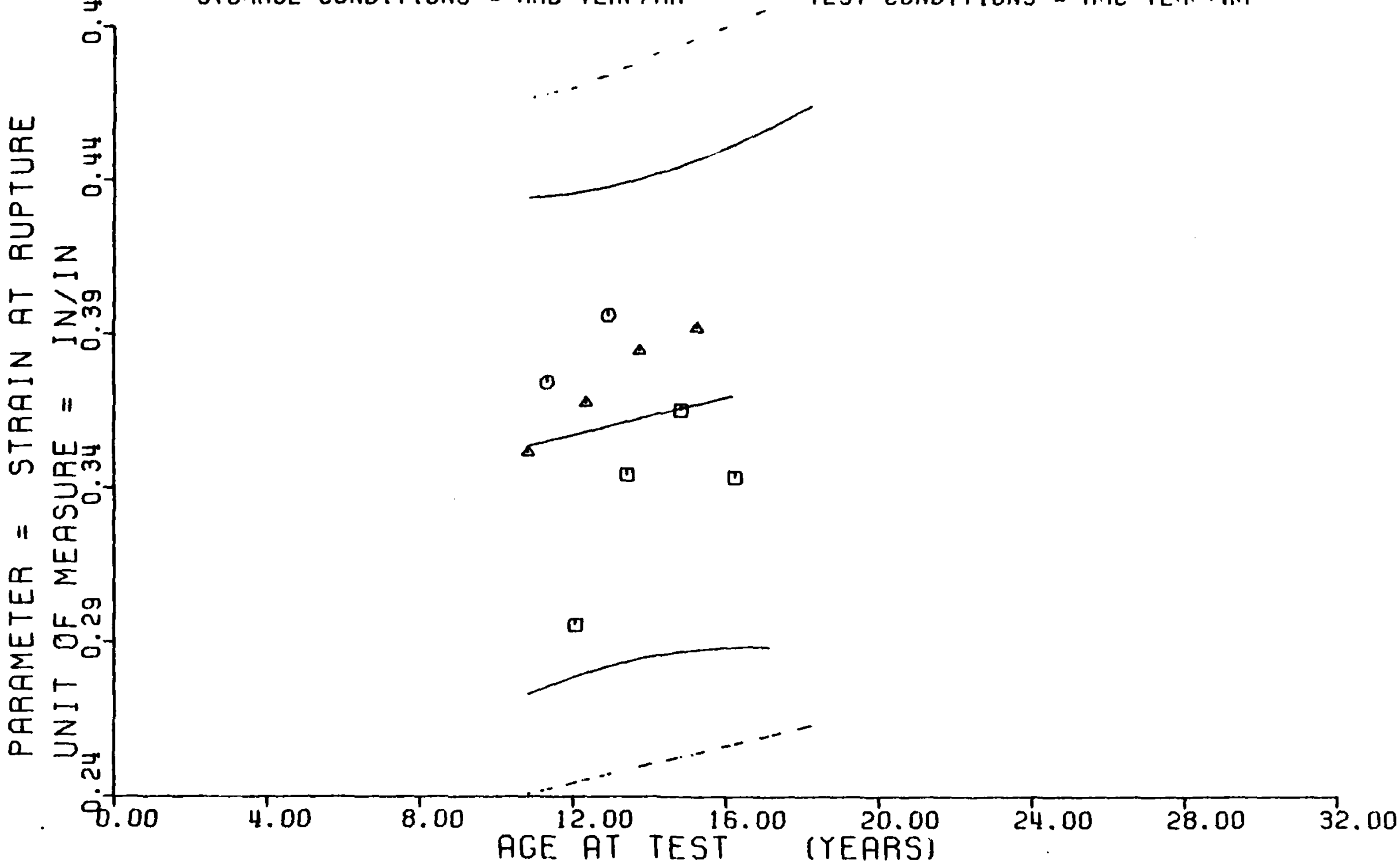
F = +5.2315815E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_1 = +3.7324158E-02

R = +1.3786923E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT S_e = +3.4688369E-04

t = +7.2329672E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT S_ε = +3.7646092E-02

N = 29 DEGREES OF FREEDOM = 27

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



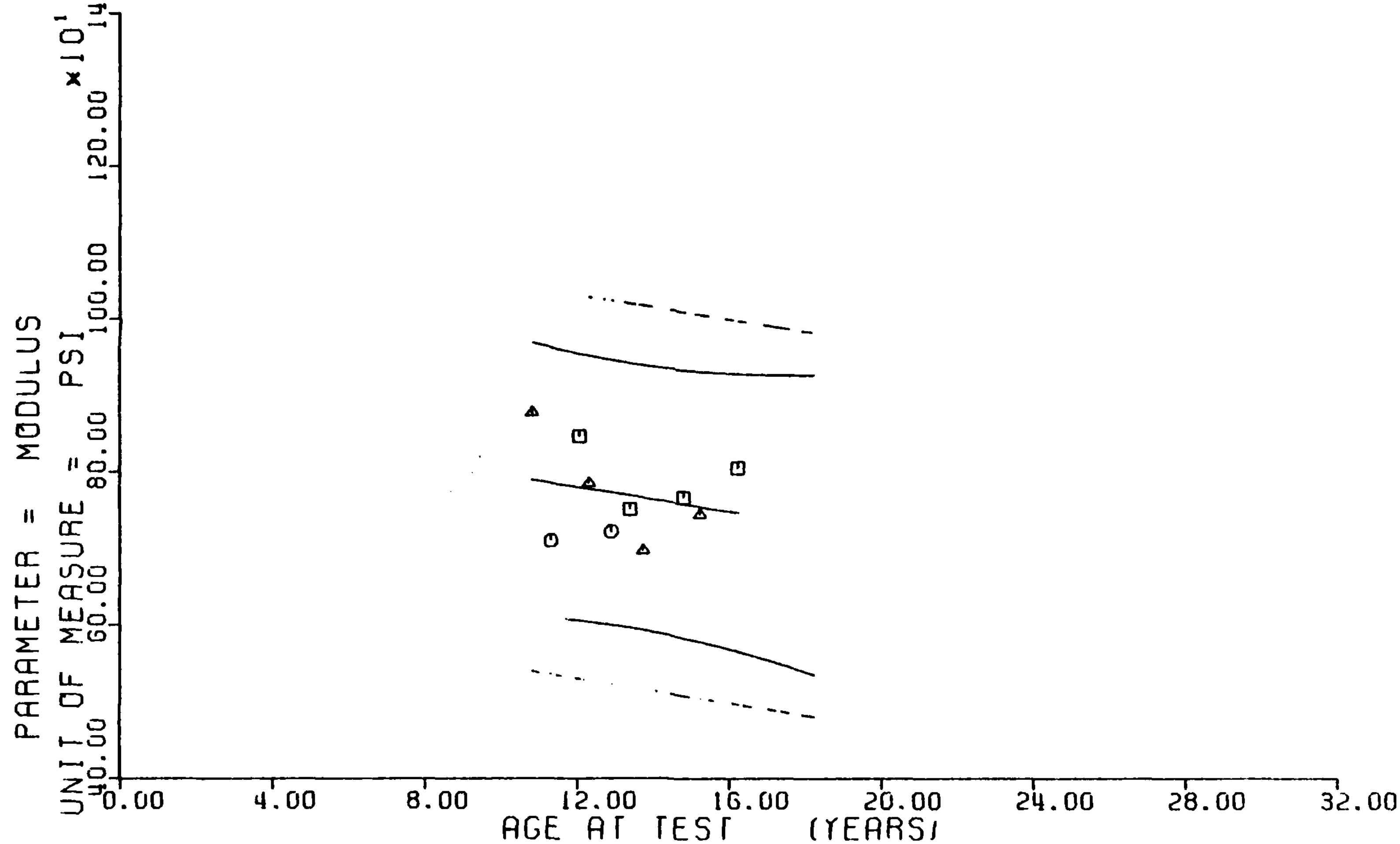
II STAGE DSCT MTRS ONLY, OUTER, AXIAL POS. BIAXIAL CHS=0.2 IN/MIN, STRAIN/RUPTURE

Figure 20

Y = ((+8.7749531E+02) + (-6.6904398E-01) * X)

F = +7.5491340E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y = +8.3201814E+01
R = -1.6492201E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT S_B = +7.7002725E-01
t = +8.6885753E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT S_E = +6.3568358E+01
N = 29 DEGREES OF FREEDOM = 27

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS AMB TEMP/RH



II STAGE DSCT MTRS ONLY, OUTER, AXIAL POS. BIAXIAL CHS=0.2 IN/MIN, MODULUS

Figure 21

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
116.0	8	+1.0881115E+02	+2.0351905E+00	+1.1076998E+02	+1.0468998E+02	+1.1253778E+02
122.0	8	+1.0042492E+02	+4.9396021E+00	+1.0586999E+02	+9.4229995E+01	+1.1221572E+02
129.0	8	+1.2839617E+02	+5.4958664E+00	+1.3267999E+02	+1.1665998E+02	+1.1184001E+02
136.0	3	+1.1561994E+02	+5.4480992E+00	+1.2177999E+02	+1.1143998E+02	+1.1146429E+02
143.0	3	+1.3641992E+02	+6.9537421E-01	+1.3717999E+02	+1.3589999E+02	+1.1108857E+02
145.0	3	+1.0451325E+02	+1.5647966E+00	+1.0629998E+02	+1.0342999E+02	+1.1098123E+02
148.0	3	+1.0155329E+02	+1.2789654E+00	+1.0289999E+02	+1.0035998E+02	+1.1082020E+02
155.0	3	+1.0219326E+02	+1.9096078E+00	+1.0406999E+02	+1.0025999E+02	+1.1044448E+02
161.0	3	+1.2264997E+02	+8.5328667E-01	+1.2347999E+02	+1.2177999E+02	+1.1012245E+02
167.0	6	+9.5566558E+01	+6.5916284E+00	+1.0339999E+02	+8.3500000E+01	+1.0980041E+02
178.0	3	+1.1298330E+02	+1.2555533E+01	+1.2664999E+02	+1.0195999E+02	+1.0920999E+02
195.0	2	+1.1413998E+02	+9.9419973E+00	+1.2116999E+02	+1.0710998E+02	+1.0829753E+02

STAGE II DISSECTED MTRS.INNER.AXIAL POS. BIAXIAL CHS=0.2 IN/MIN.MAX STRESS

This sample size summary is applicable to figures 22 thru 24

Y = ((+1.1876396E+02) + (-5.3673958E-02) * X)

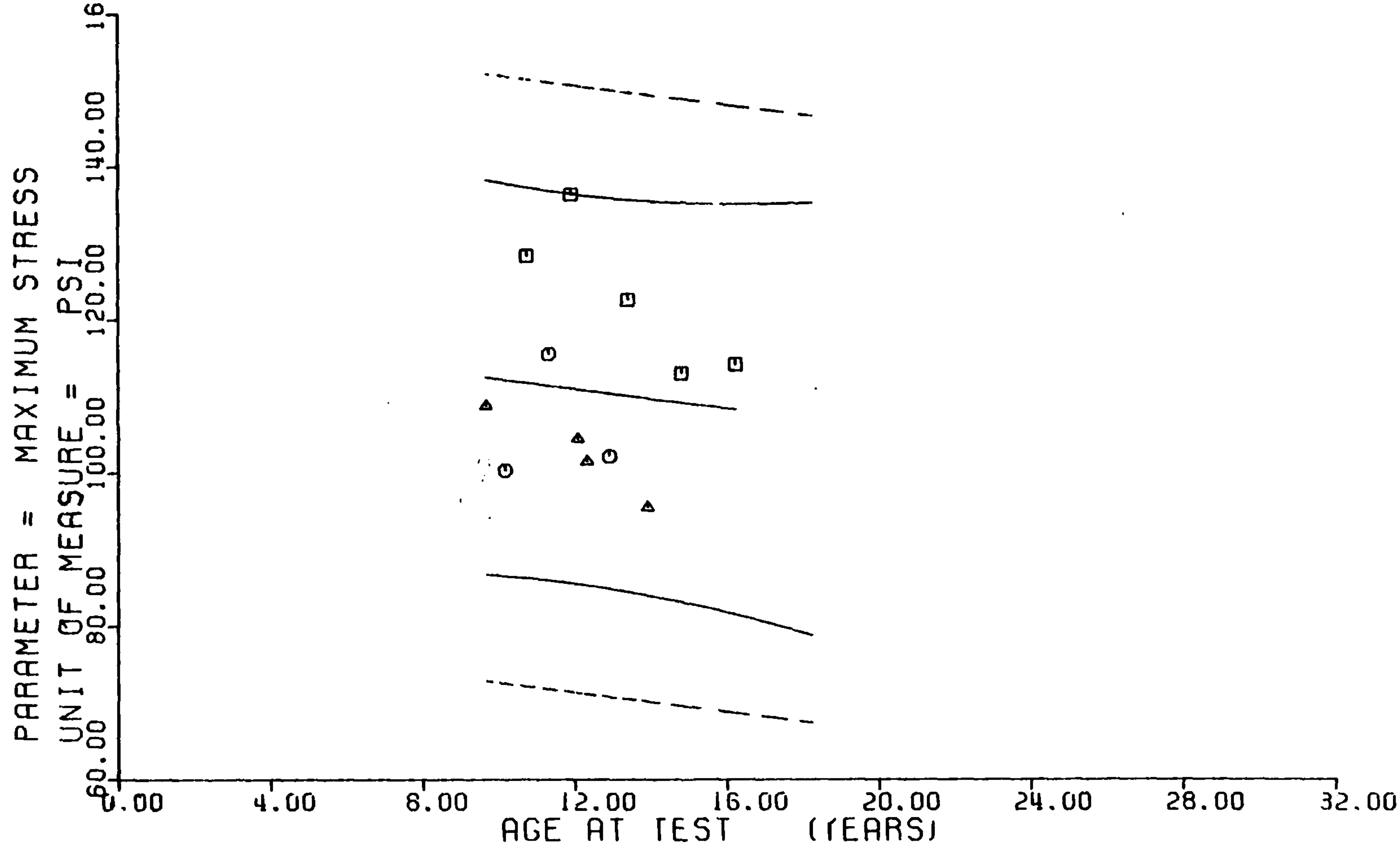
F = +4.1369680E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_1 = +1.3133530E+01

R = -8.9701905E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT S_B = +8.3449269E-02

ι = +6.4319266E-01 SIGNIFICANCE OF ι = NOT SIGNIFICANT S_E = +1.3208203E+01

N = 53 DEGREES OF FREEDOM = 51

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



STAGE II DISSECTED MTRS, INNER, AXIAL POS. BIAXIAL CHS=0.2 IN/MIN, MAX STRESS

Figure 22

Y = ((+5.4708488E-01) + (-6.4604023E-04) × X)

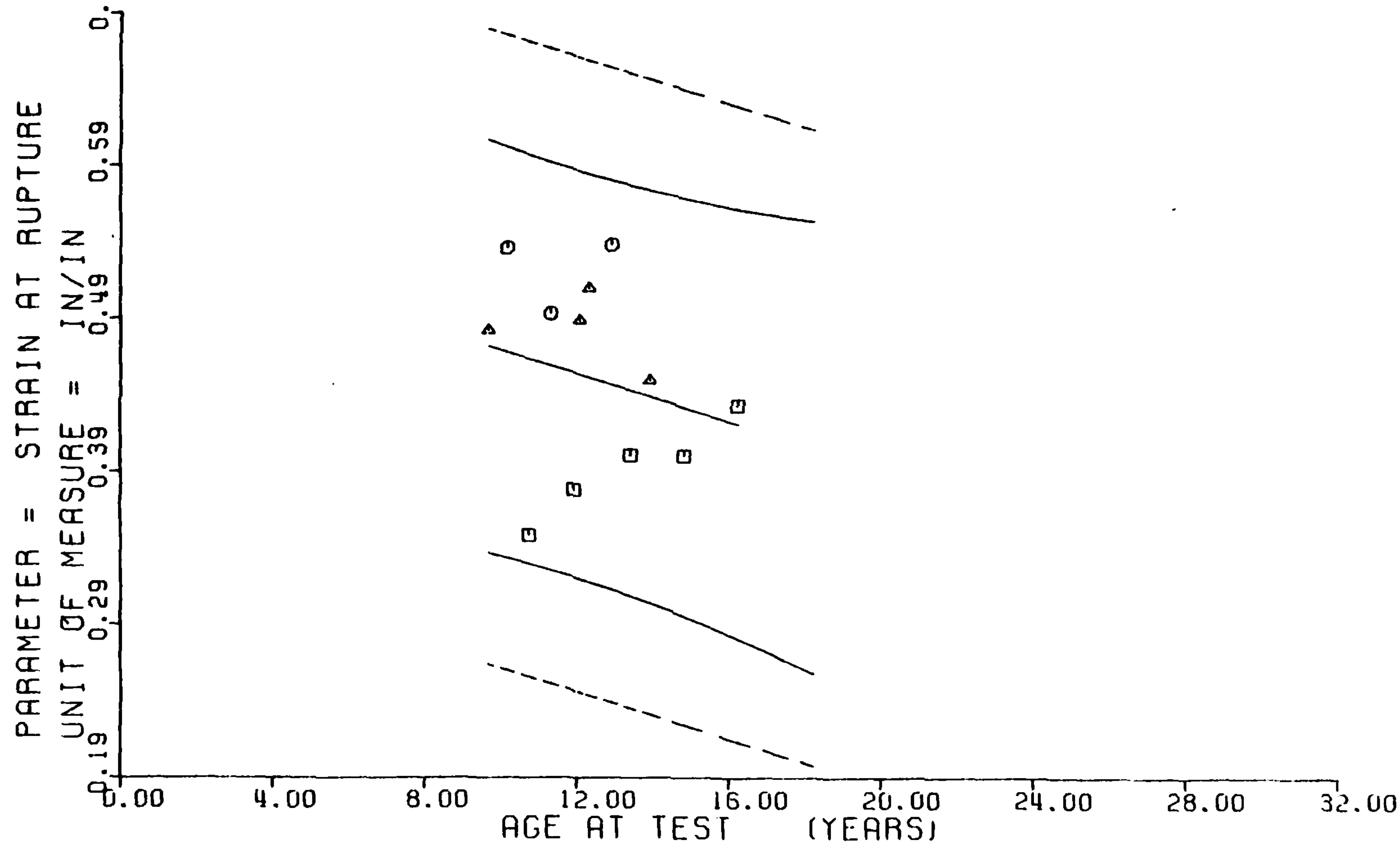
F = +2.1798306E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y = +7.0039202E-02

R = -2.0245938E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT S_B = +4.3757065E-04

t = +1.4764249E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT S_ϵ = +6.9257910E-02

N = 53 DEGREES OF FREEDOM = 51

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



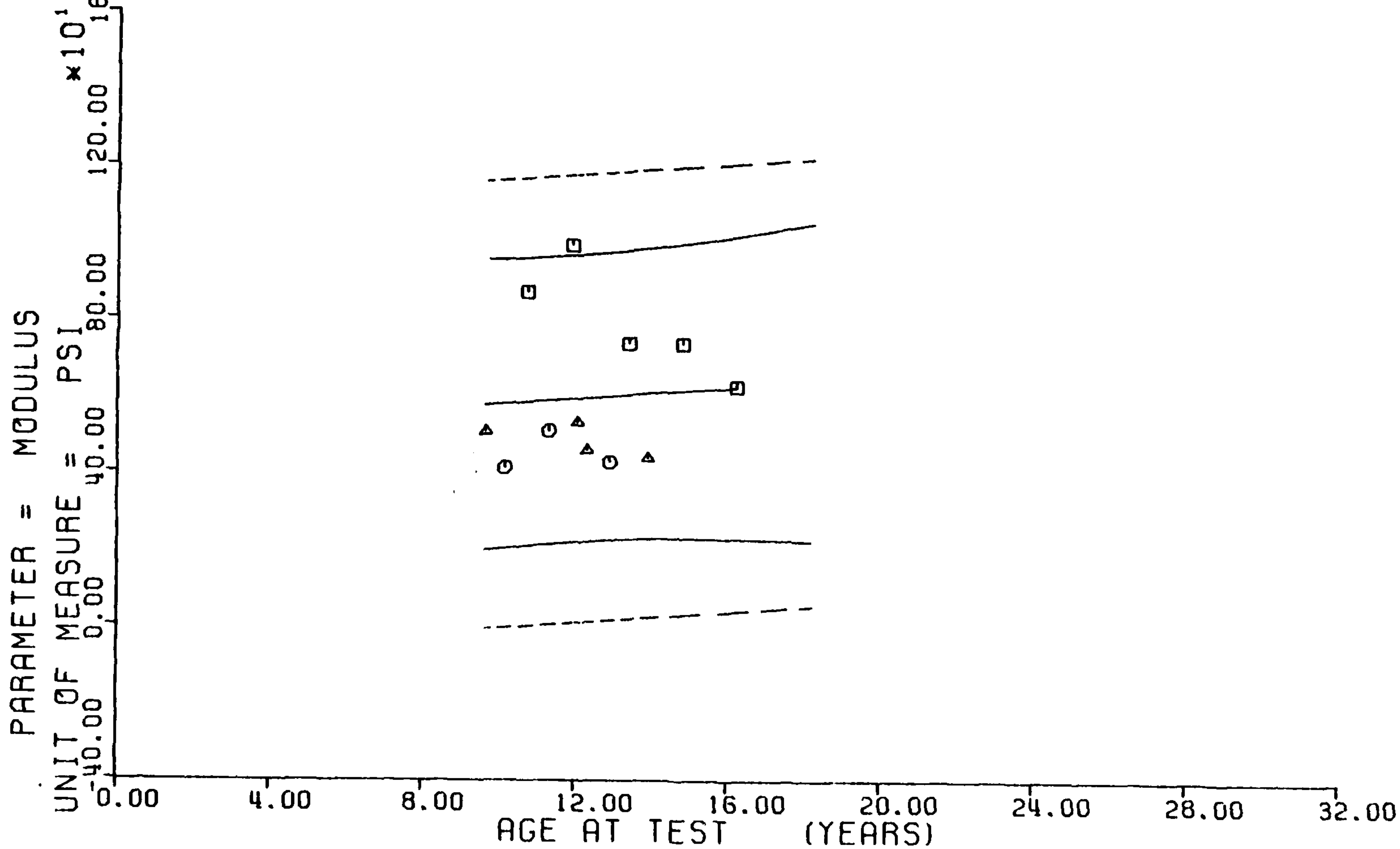
II STAGE DSCT MTRS, INNER, AXIAL POS, BIAXIAL CHS=0.2 IN/MIN, STRAIN AT RUPURE

Figure 23

Y = ((+5.0757240E+02) + (+5.9256745E-01) × X)

F = +2.3331577E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y = +1.9273540E+02
R = +6.7483223E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT S_β = +1.2267773E+00
ι = +4.8302771E-01 SIGNIFICANCE OF ι = NOT SIGNIFICANT S_ε = +1.9417215E+02
N = 53 DEGREES OF FREEDOM = 51

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTRS, INNER, AXIAL POS, BIAXIAL CHS=0.2 IN/MIN, MODULUS

Figure 24

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
116.0	8	+6.2769530E+02	+1.3668604E+01	+6.4366992E+02	+6.0285986E+02	+6.2656616E+02
122.0	8	+6.0693212E+02	+9.2450688E+00	+6.1859985E+02	+5.9466992E+02	+6.2518603E+02
129.0	8	+6.3754589E+02	+1.4666667E+01	+6.5463989E+02	+6.1350000E+02	+6.2357592E+02
148.0	3	+6.0643652E+02	+2.3380559E+00	+6.0672998E+02	+6.0393994E+02	+6.1920556E+02
155.0	3	+6.3951660E+02	+6.4245224E+00	+6.4642993E+02	+6.3372998E+02	+6.1759545E+02
161.0	3	+6.2420654E+02	+8.2544055E+00	+6.3342993E+02	+6.1750000E+02	+6.1621533E+02
166.0	3	+6.0773657E+02	+1.5744462E+01	+6.1869995E+02	+5.8969995E+02	+6.1506518E+02
179.0	3	+6.2197314E+02	+3.2874800E+00	+6.2469995E+02	+6.1622998E+02	+6.1207495E+02
183.0	3	+6.0779980E+02	+8.8654459E+00	+6.1778979E+02	+6.0084985E+02	+6.1115502E+02
196.0	3	+5.9488305E+02	+1.9831572E+00	+5.9670996E+02	+5.9279980E+02	+6.0816479E+02

II STAGE DSCT MTRS,OUTER,AXIAL,H.R.TRIAX.CHS=1750 AT 500 PSI,MAXIMUM STRESS

This sample size summary is applicable to figures 25 thru 30

Y = ((+6.5324845E+02) + (-2.3001855E-01) * X)

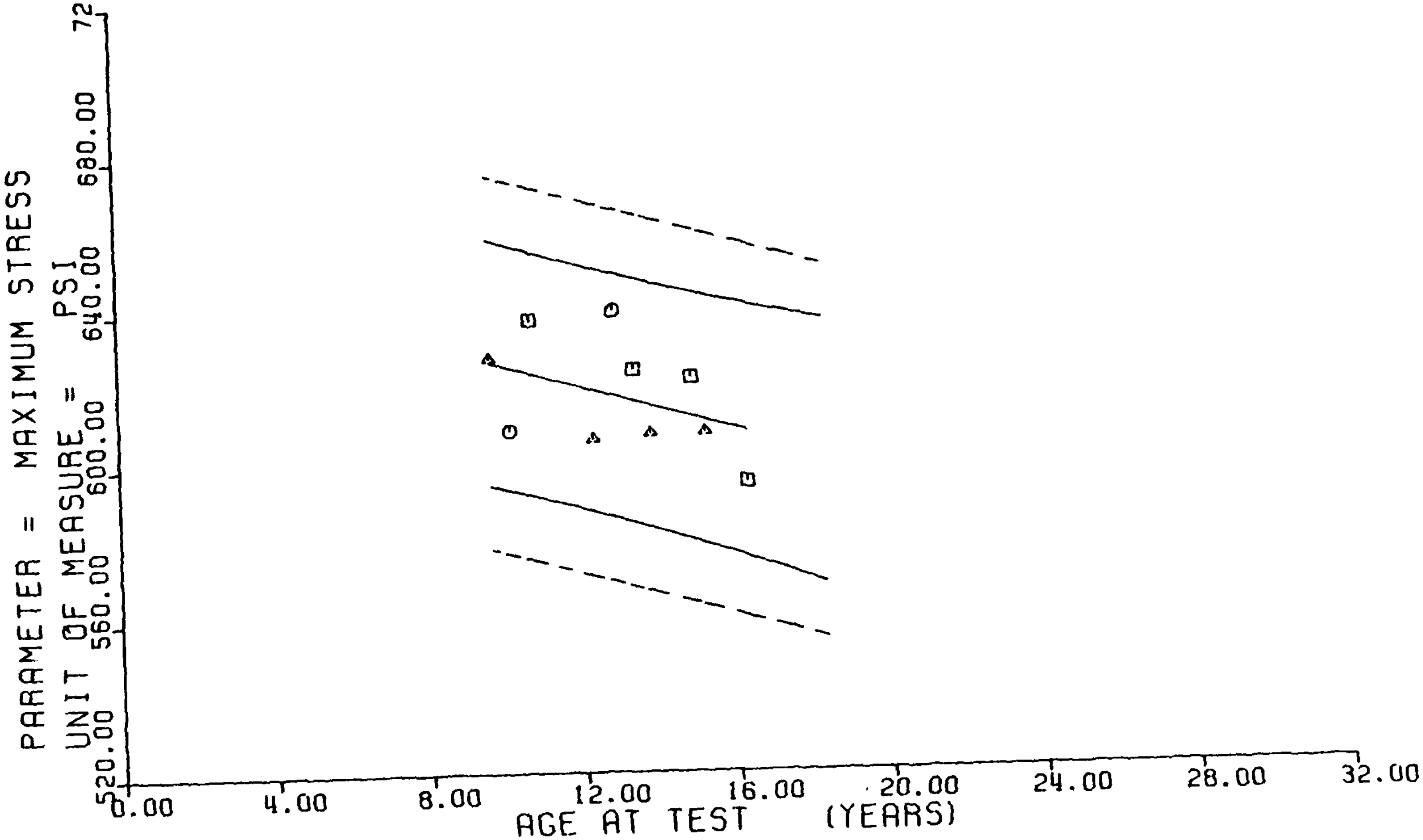
F = +6.3296905E+00 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +1.7048499E+01

A = -3.5820945E-01 SIGNIFICANCE OF A = SIGNIFICANT S_a = +9.1426403E-02

ι = +2.5158876E+00 SIGNIFICANCE OF ι = SIGNIFICANT S_ε = +1.6101202E+01

N = 45 DEGREES OF FREEDOM = 43

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



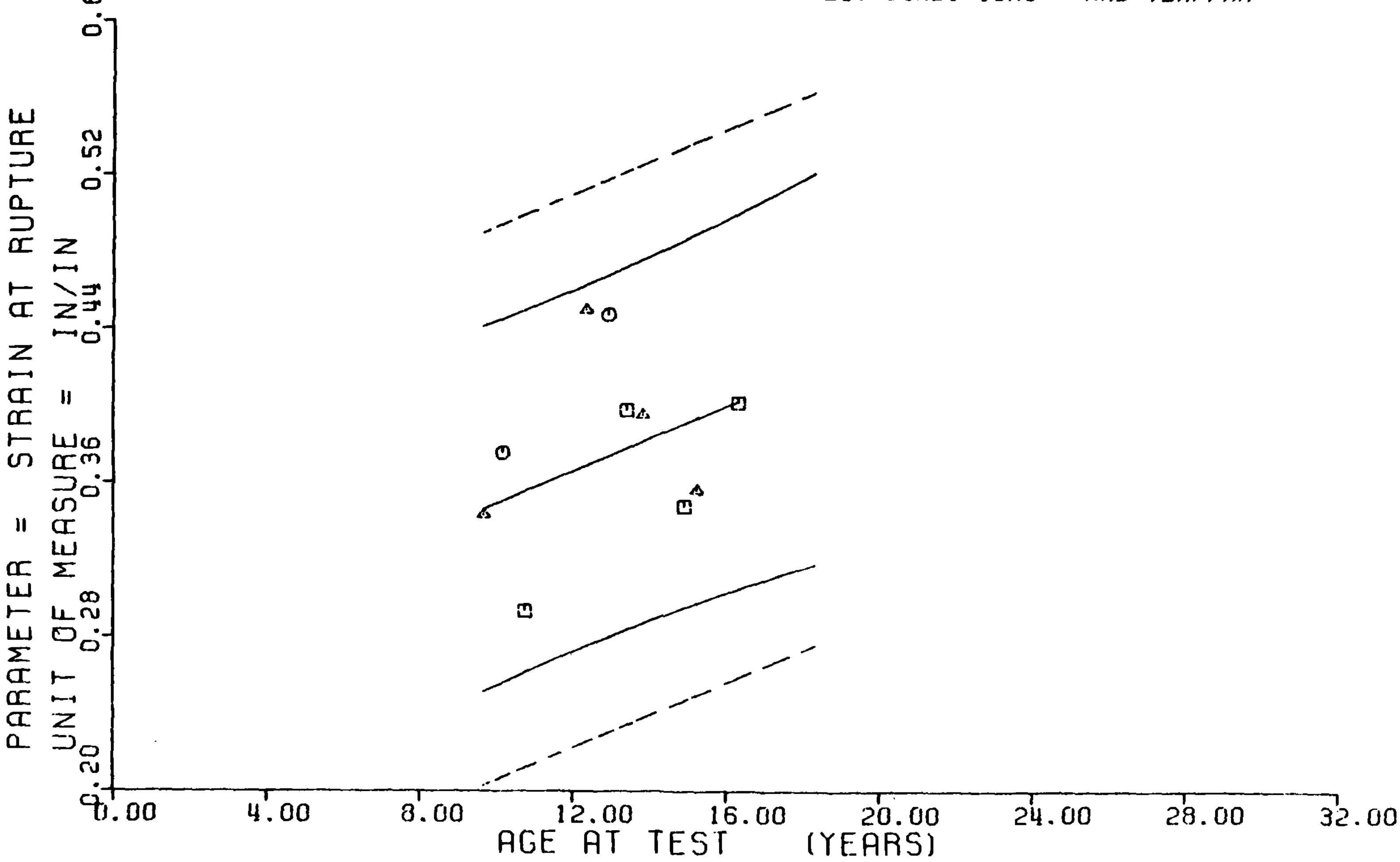
II STAGE DSCT MTRS,OUTER,AXIAL,H.R.TRIAX.CHS=1750 AT 500 PSI,MAXIMUM STRESS

Figure 25

$Y = ((+2.6524508E-01) + (+6.9988786E-04) * X)$

F = +6.6246953E+00	SIGNIFICANCE OF F = SIGNIFICANT		σ_Y = +5.0857471E-02
R = +3.6537096E-01	SIGNIFICANCE OF R = SIGNIFICANT		S_B = +2.7192272E-04
t = +2.5738483E+00	SIGNIFICANCE OF t = SIGNIFICANT		S_E = +4.7888604E-02
N = 45	DEGREES OF FREEDOM = 43		

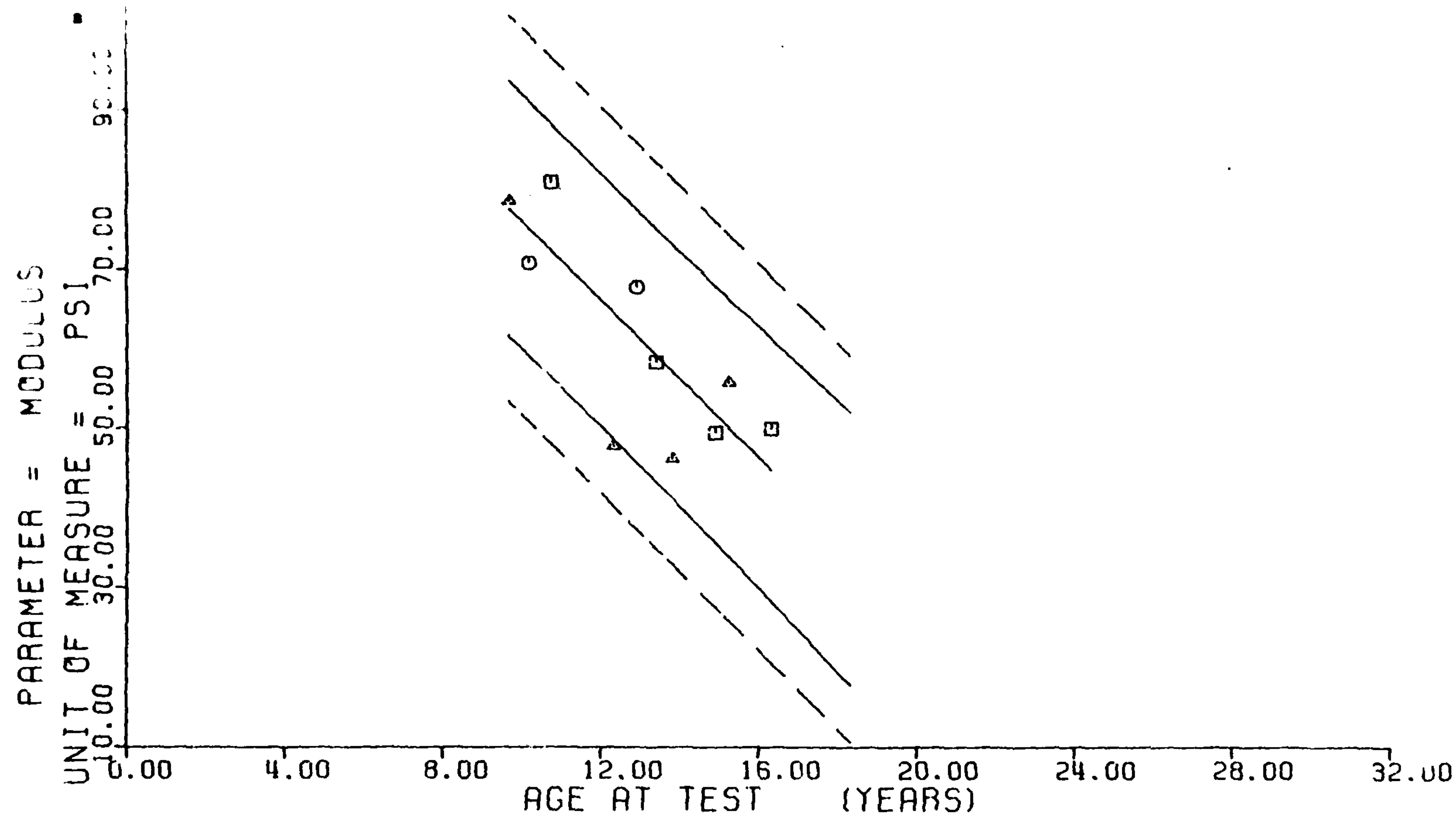
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTRS,OUTER,AXIAL,H.R.TRIAX.CHS=1750 AT 500 PSI,STRAIN/RUPTURE

Figure 26

Y = ((+1.2558892E+04) + (-4.1222948E+01) * X)
·H 033'029E+01   SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +1.3560891E+03
H.0706988E-01   SIGNIFICANCE OF R = SIGNIFICANT S_B = +4.5991880E+00
·H.9630926E+00   SIGNIFICANCE OF t = SIGNIFICANT S_E = +8.0996795E+02
45   DEGREES OF FREEDOM = 43
STORAGE CONDITIONS = AMB TEMP/RH   TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTRS, OUTER, AXIAL, H.R. TRIAX. CHS=1750 AT 500 PSI, MODULUS

Figure 27

Y = ((+6.9652717E+02) + (-3.2501361E-01) * X)

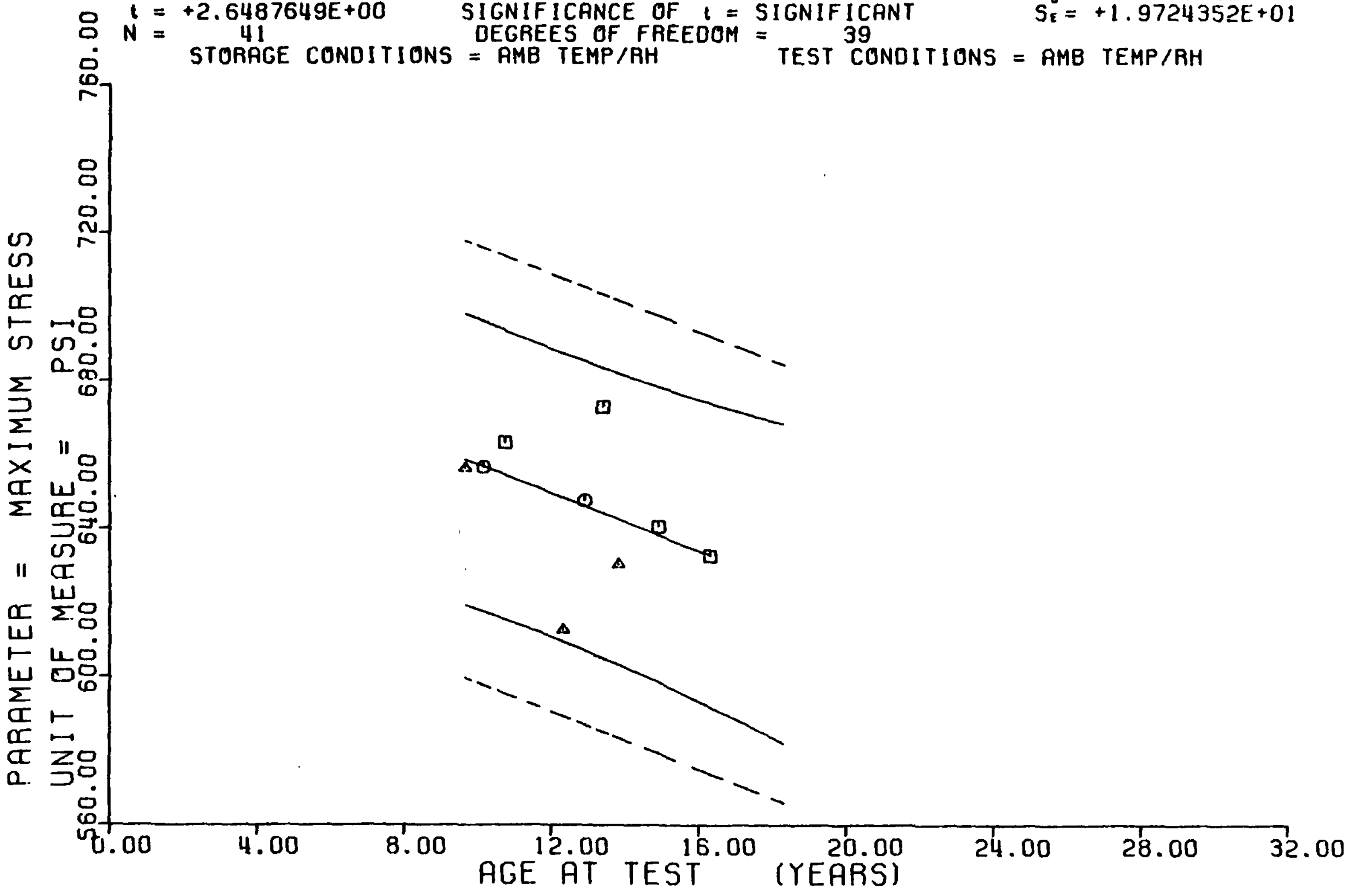
F = +7.0159556E+00 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +2.1155679E+01

R = -3.9047136E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +1.2270383E-01

t = +2.6487649E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +1.9724352E+01

N = 41 DEGREES OF FREEDOM = 39

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH

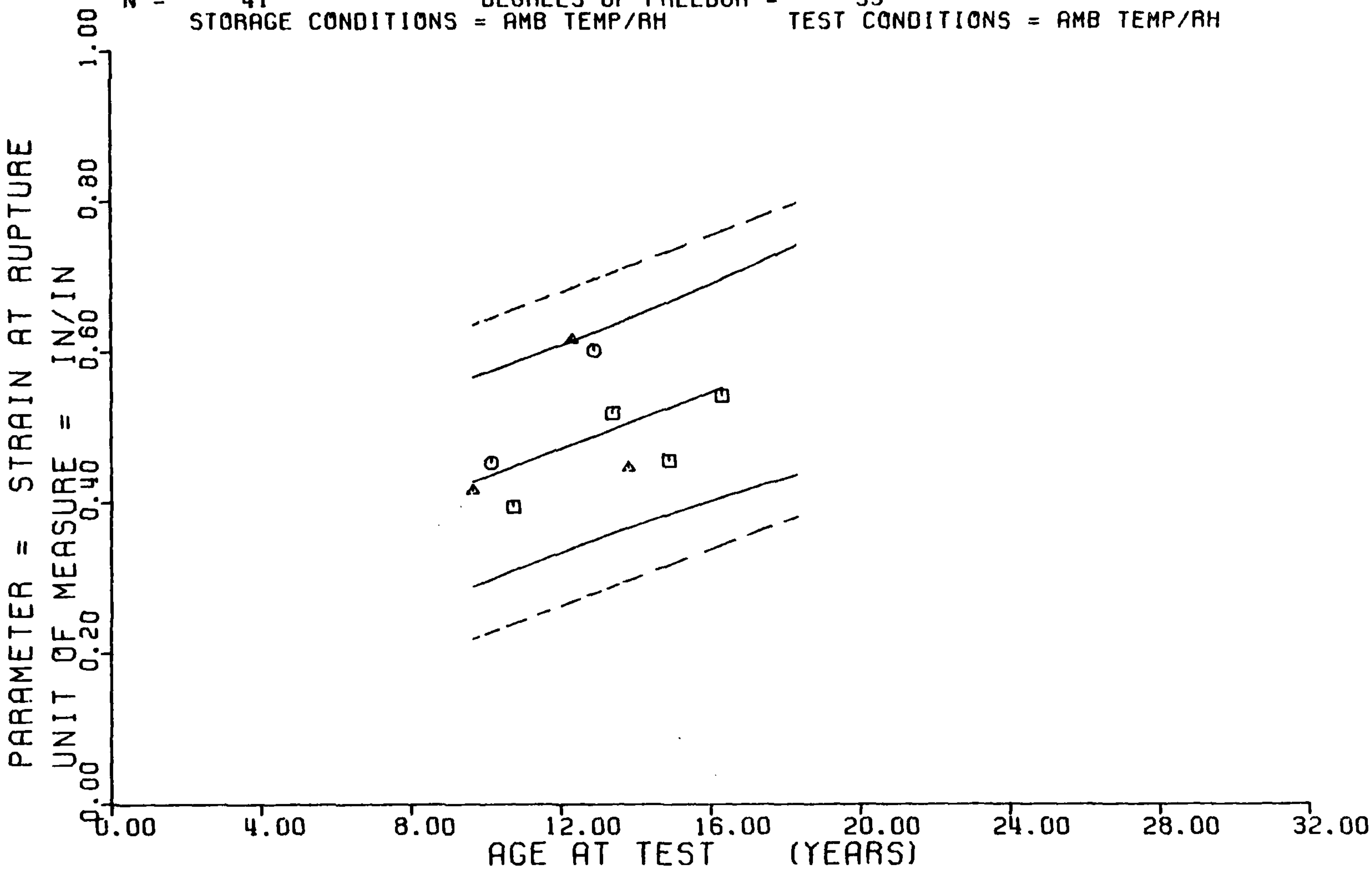


II STAGE DSCT MTRS, INNER, AXIAL, H.R. TRIAX. CHS=1750 AT 500 PSI, MAXIMUM STRESS

Figure 28

Y = ((+2.4696227E-01) + (+1.5560038E-03) * X)

F = +1.2982393E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +7.9136354E-02
R = +4.9974591E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +4.3185035E-04
ι = +3.6031089E+00 SIGNIFICANCE OF ι = SIGNIFICANT S_E = +6.9418927E-02
N = 41 DEGREES OF FREEDOM = 39
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTRS, INNER, AXIAL, H.R. TRIAX. CHS=1750 AT 500 PSI, STRAIN/RUPTURE

Figure 29

Y = ((+1.4064995E+04) + (-5.3701806E+01) * X)

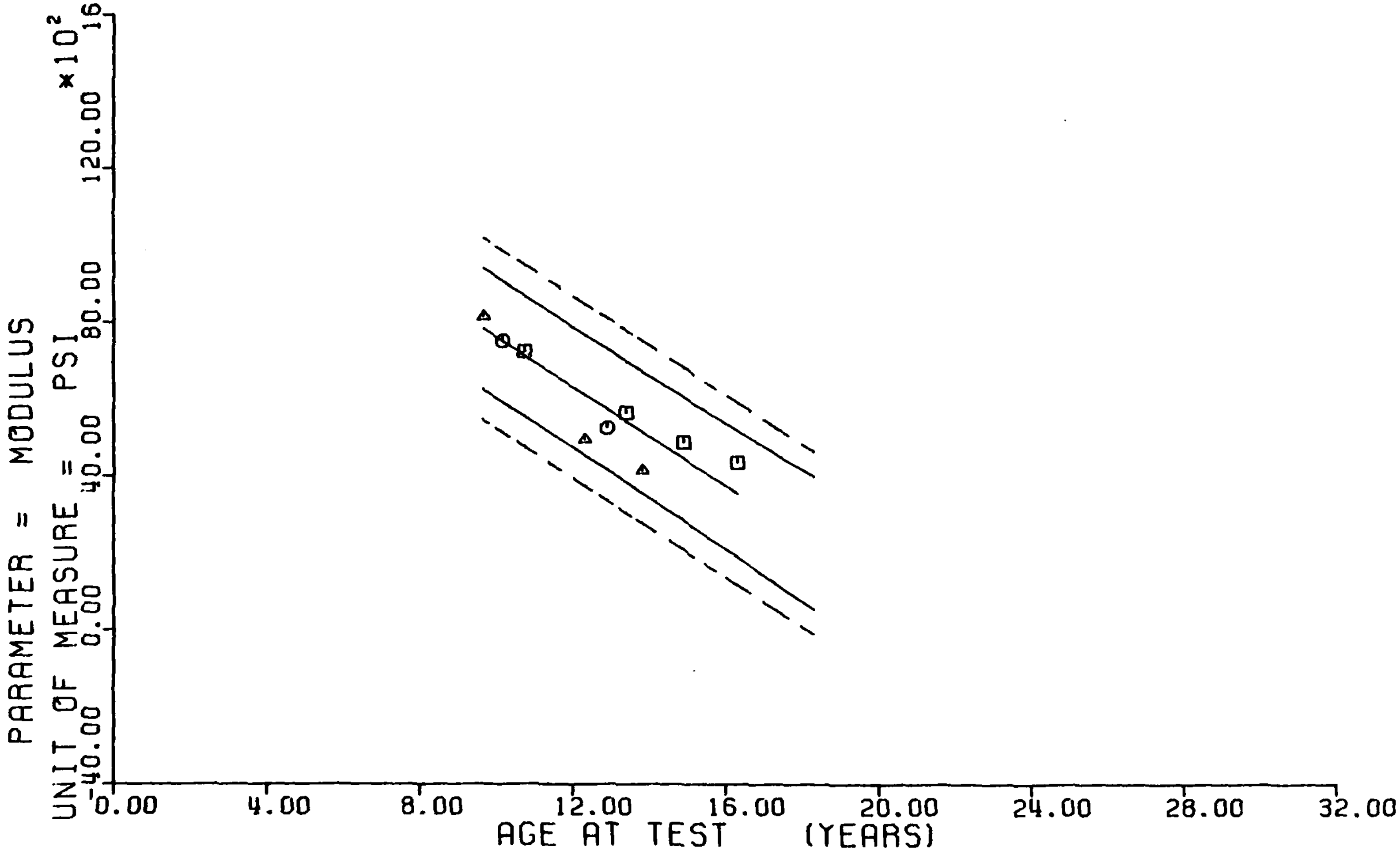
F = +1.1986786E+02 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +1.5713399E+03

R = -8.6862706E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +4.9049830E+00

ι = +1.0948418E+01 SIGNIFICANCE OF ι = SIGNIFICANT S_E = +7.8846446E+02

N = 41 DEGREES OF FREEDOM = 39

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE OSCT MTRS, INNER, AXIAL, H.R. TRIAX. CHS=1750 AT 500 PSI, MODULUS

Figure 30

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
156.0	3	+4.7880322E+02	+1.5493699E+01	+4.9652978E+02	+4.6787988E+02	+4.9494042E+02
162.0	3	+5.7305639E+02	+9.4188825E+01	+6.4626977E+02	+4.6679980E+02	+5.1106518E+02
164.0	3	+5.1984326E+02	+9.6228825E+00	+5.3072998E+02	+5.1250000E+02	+5.1644018E+02
169.0	3	+4.5136645E+02	+1.3183783E+01	+4.6609985E+02	+4.4069995E+02	+5.2987768E+02
177.0	3	+5.4175634E+02	+3.7589644E+01	+5.8229980E+02	+5.0806982E+02	+5.5137744E+02
183.0	3	+6.2376977E+02	+4.4178599E+01	+6.7050976E+02	+5.8269995E+02	+5.6750219E+02
196.0	3	+5.8504638E+02	+1.2616021E+01	+5.9833984E+02	+5.7326977E+02	+6.0243945E+02

II STAGE DSCT MTRS.OUTER.LOW RATE.CHS=20.0 IN/MIN.T/PRES=500 PSI. MAX STRESS

This sample size summary is applicable to figures 31 thru 36

Y = ((+7.5694046E+01) + (+2.6874772E+00) * X)

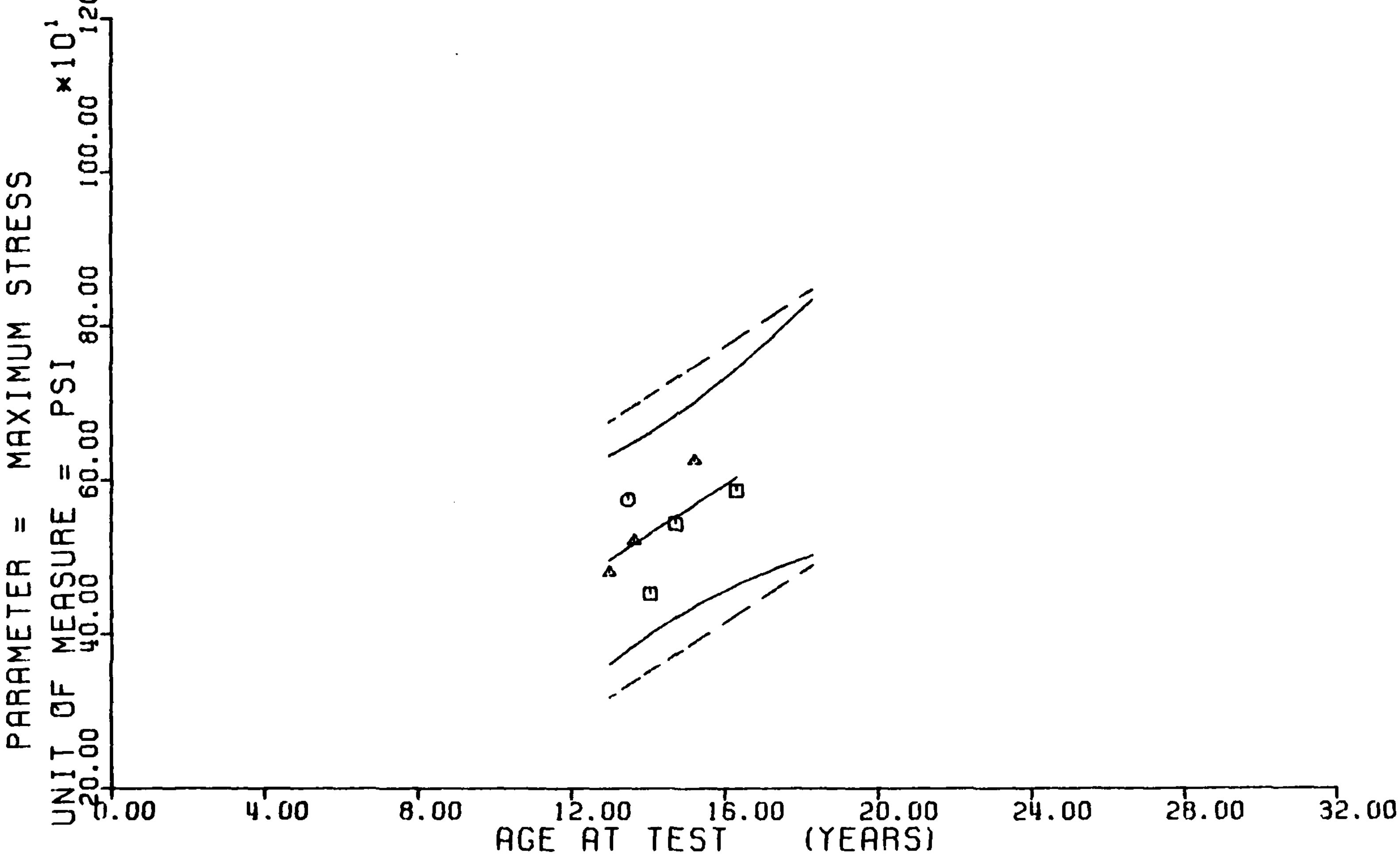
F = +7.0307235E+00 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +6.7909181E+01

R = +5.1970499E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +1.0135490E+00

t = +2.6515511E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +5.9525132E+01

N = 21 DEGREES OF FREEDOM = 19

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = T/TEMP=020 DEG(F

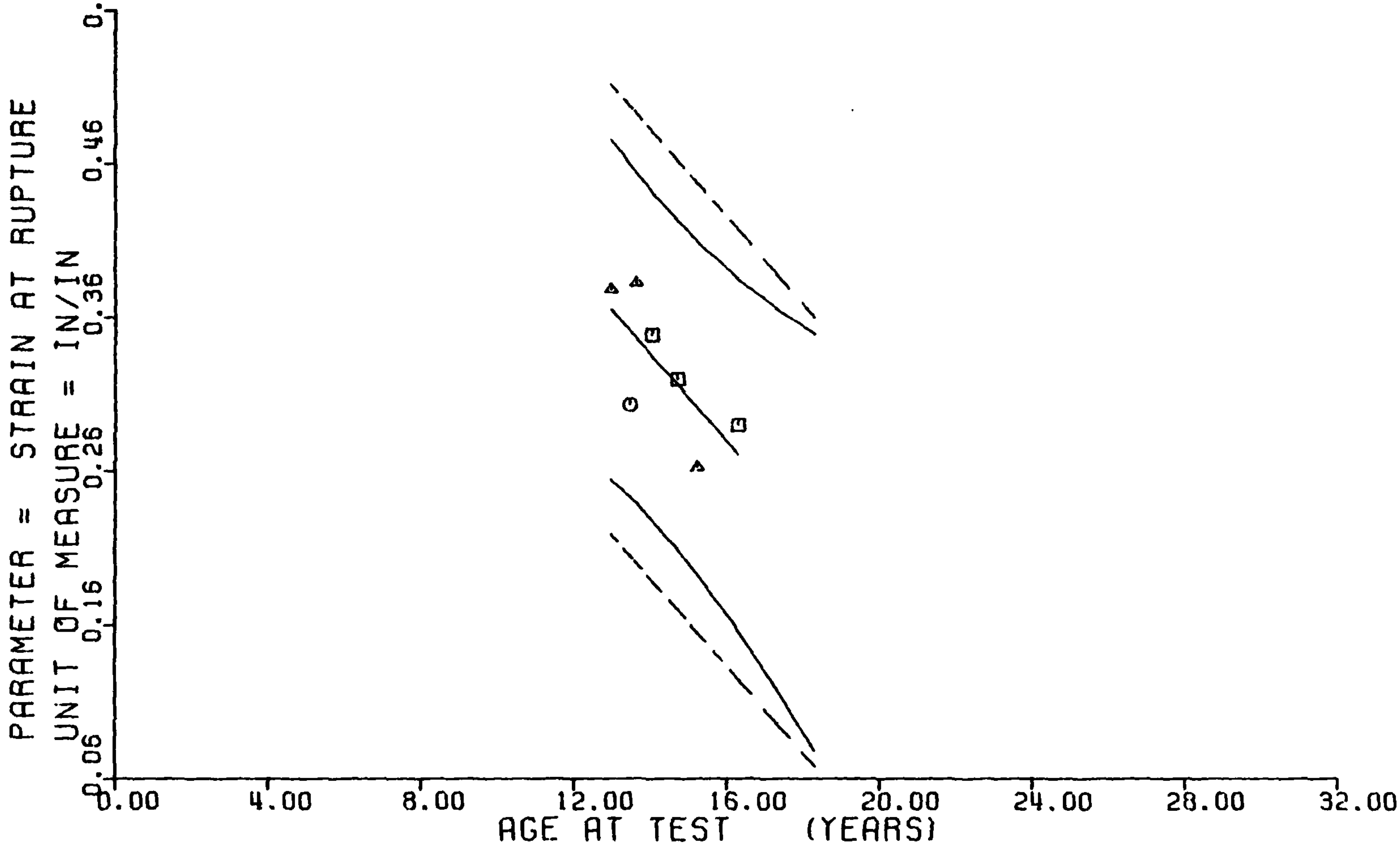


II STAGE DSCT MTRS,OUTER,LOW RATE,CHS=20.0 IN/MIN,T/PRES=500 PSI, MAX STRESS

Figure 31

$Y = ((+7.3577223E-01) + (-2.3718356E-03) * X)$

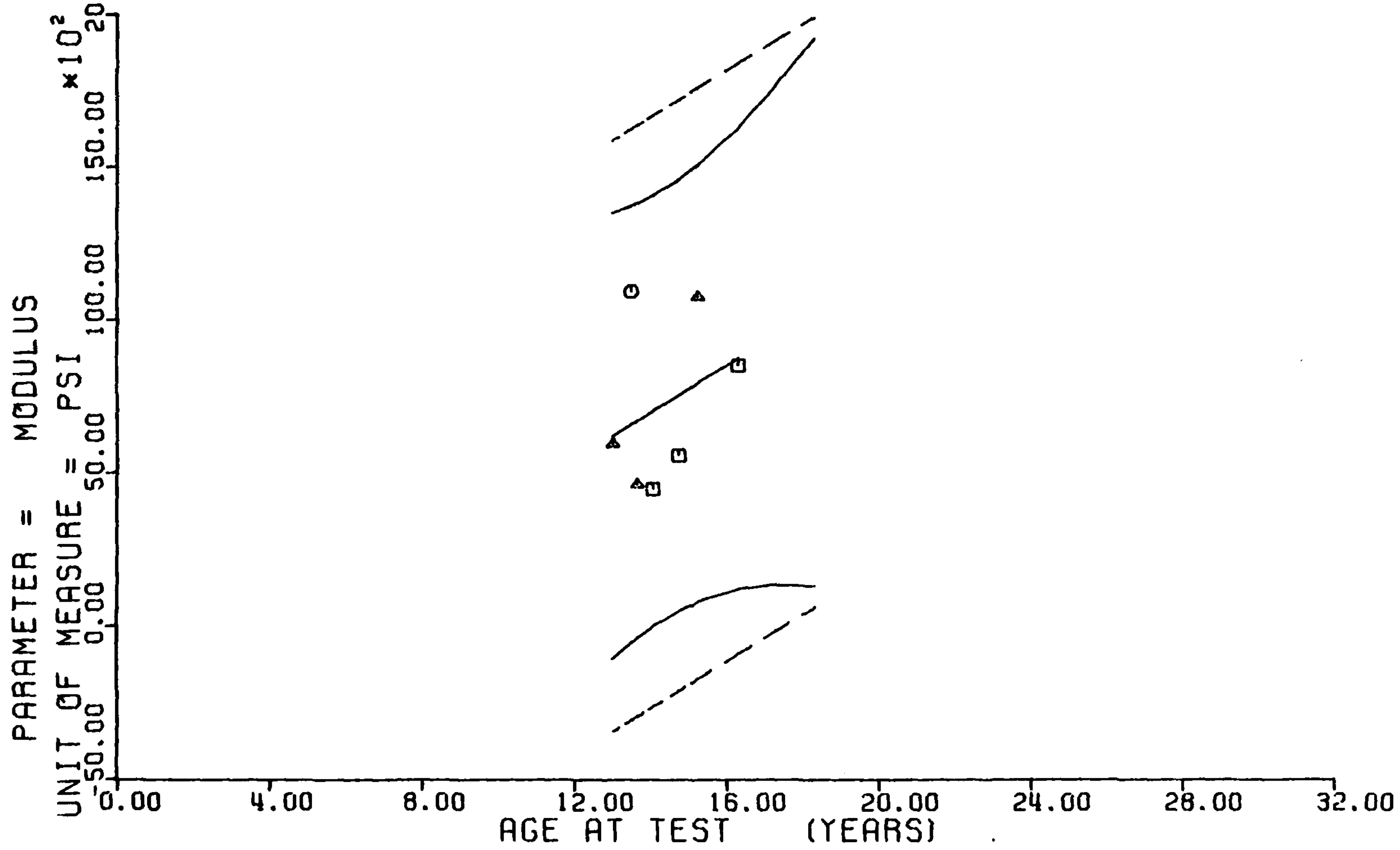
F = +8.1561262E+00 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +5.6835165E-02
R = -5.4803470E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +8.3050571E-04
t = +2.8558932E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +4.8775105E-02
N = 21 *DEGREES OF FREEDOM* = 19
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = T/TEMP=020 DEG (F



II STAGE DSCT MTRS, OUTER, LOW RATE, CHS=20.0 IN/MIN, T/PRES=500 PSI, STRN/RUPT

Figure 32

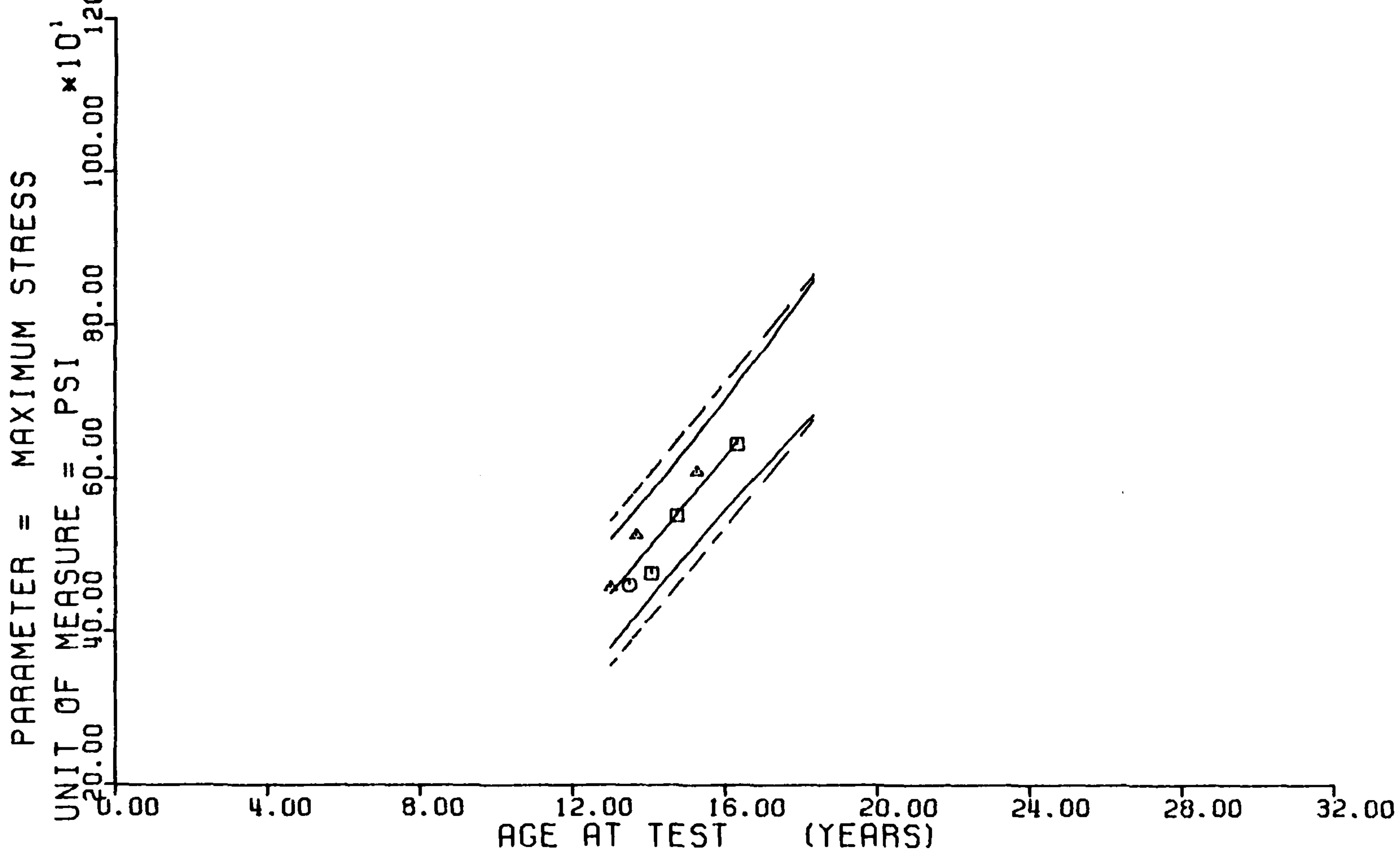
```
                 Y  = (( -3.6474567E+03 ) + ( +6.3346752E+01 ) * X)
F = +1.3375608E+00     SIGNIFICANCE OF F = NOT SIGNIFICANT    σY= +3.2438264E+03
R = +2.5645273E-01     SIGNIFICANCE OF R = NOT SIGNIFICANT    SB= +5.4773132E+01
t = +1.1565296E+00     SIGNIFICANCE OF t = NOT SIGNIFICANT    SE= +3.2167934E+03
N =      21             DEGREES OF FREEDOM =      19
     STORAGE CONDITIONS = AMB TEMP/RH        TEST CONDITIONS = T/TEMP=020 DEG(F
```



II STAGE OSCT MTRS,OUTER,LOW RATE,CHS=20.0 IN/MIN,T/PRES=500 PSI, MODULUS

Figure 33

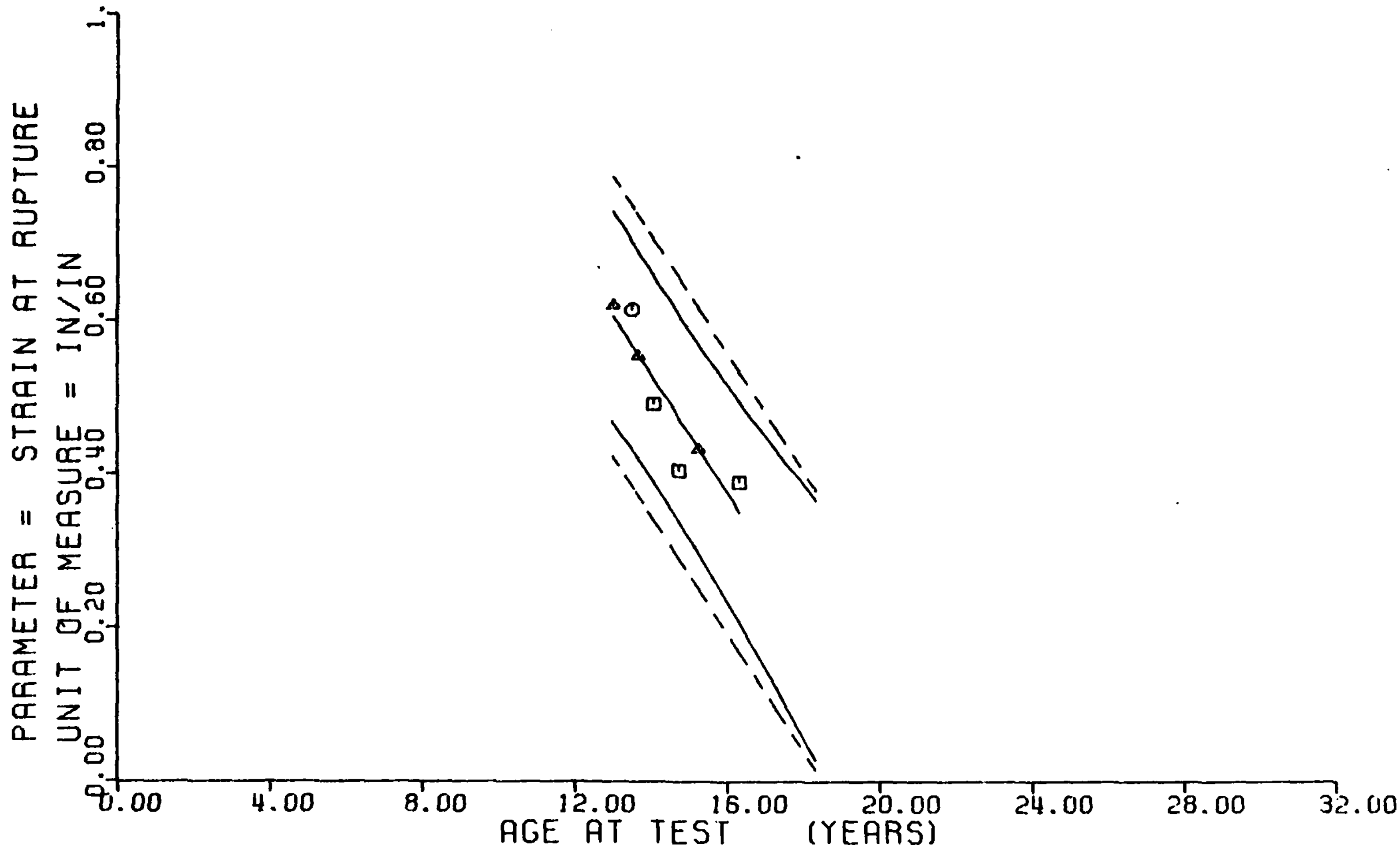
Y = ((-3.3579416E+02) + (+5.0299275E+00) * X)
F = +8.7011568E+01   SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +7.2910562E+01
R = +9.0596593E-01   SIGNIFICANCE OF R = SIGNIFICANT S_B = +5.3922898E-01
t = +9.3279991E+00   SIGNIFICANCE OF t = SIGNIFICANT S_E = +3.1668596E+01
N = 21   DEGREES OF FREEDOM = 19
STORAGE CONDITIONS = AMB TEMP/RH   TEST CONDITIONS = T/TEMP=020 DEG(F



II STAGE OSCT MTRS,INNER,LOW RATE,CHS=20.0 IN/MIN,T/PRES=500 PSI, MAX STRESS

Figure 34

```
                 Y   =  (( +1.6029617E+00 )  +  ( -6.3891732E-03 )  * X)
F = +3.8241408E+01     SIGNIFICANCE OF F = SIGNIFICANT          σ₁= +1.0265343E-01
R = -8.1735699E-01     SIGNIFICANCE OF R = SIGNIFICANT          S₀= +1.0331841E-03
ι = +6.1839637E+00     SIGNIFICANCE OF ι = SIGNIFICANT          Sε= +6.0678288E-02
N =      21             DEGREES OF FREEDOM =      19
    STORAGE CONDITIONS = AMB TEMP/RH          TEST CONDITIONS = T/TEMP=020 DEG F
```



II STAGE OSCT MTRS, INNER, LOW RATE, CHS=20.0 IN/MIN, T/PRES=500 PSI, STRN/RUPT

Figure 35

Y = ((-2.0158802E+04) + (+1.4773649E+02) * X)

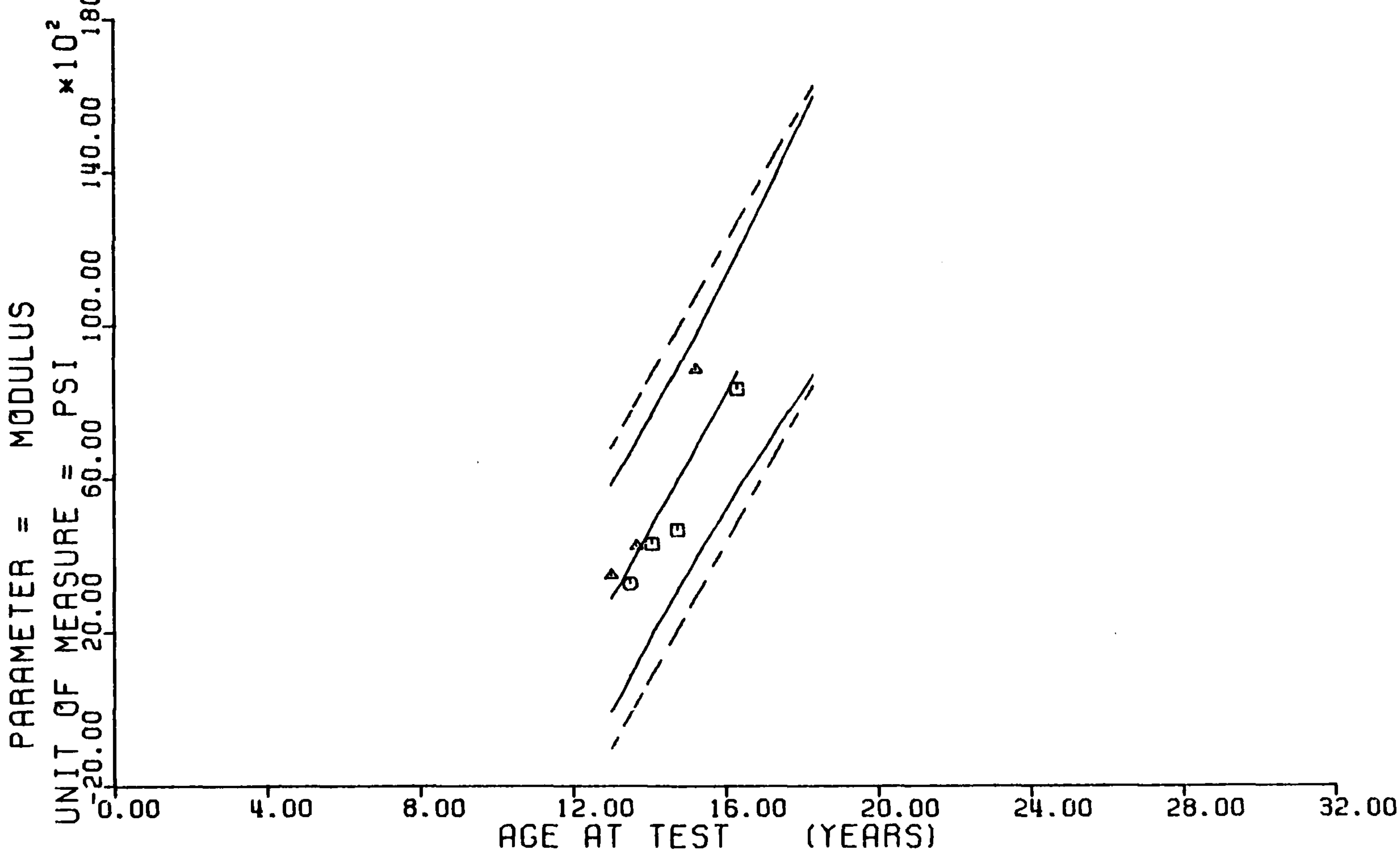
F = +4.4325630E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +2.3189463E+03

R = +8.3663821E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +2.2190155E+01

t = +6.6577496E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +1.3032145E+03

N = 21 DEGREES OF FREEDOM = 19

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = T/TEMP=020 DEG(F



II STAGE DSCT MTRS, INNER, LOW RATE, CHS=20.0 IN/MIN, T/PRES=500 PSI, MODULUS

Figure 36

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
136.0	3	+3.8496655E+02	+5.9507279E+00	+3.8839990E+02	+3.7809985E+02	+3.7847802E+02
162.0	3	+3.8696655E+02	+2.2473302E+01	+4.0739990E+02	+3.6289990E+02	+4.0140576E+02
164.0	3	+4.4494653E+02	+1.2023368E+01	+4.5619995E+02	+4.3228979E+02	+4.0904833E+02
177.0	3	+3.9487988E+02	+2.9875340E+01	+4.2265991E+02	+3.6327978E+02	+4.5872509E+02
183.0	3	+5.0439990E+02	+4.4706839E+01	+5.4950000E+02	+4.6009985E+02	+4.8165258E+02
196.0	3	+5.4447973E+02	+2.8869071E+00	+5.4770996E+02	+5.4221997E+02	+5.3132934E+02

II STAGE DSCT MTRS,OUTER,LOW RATE,CHS=2.0 IN/MIN,T/PRES=500 PSI, MAX STRESS

This sample size summary is applicable to figures 37 thru 42

Y = ((-2.1764132E+02) + (+3.8212793E+00) * X)

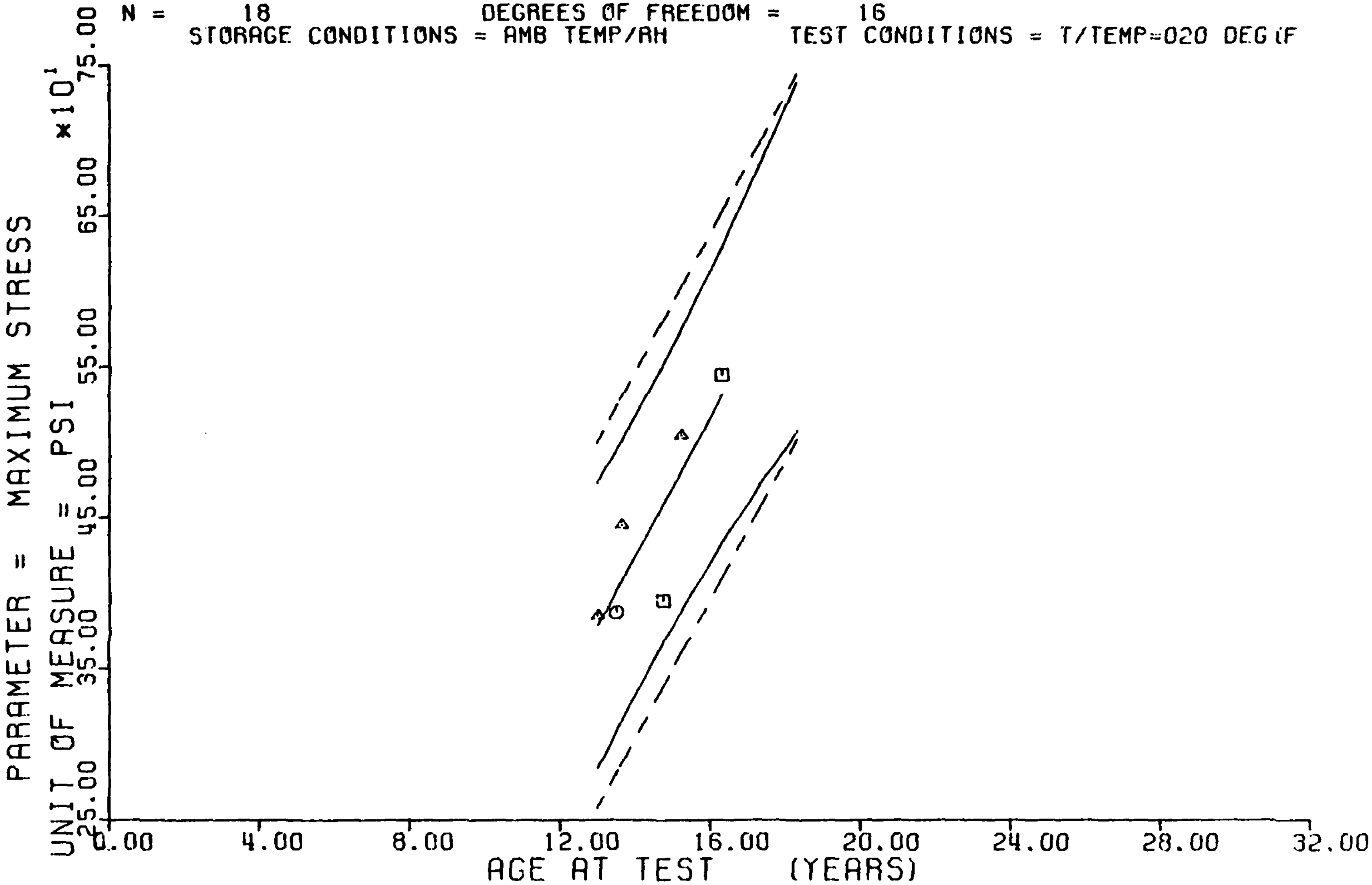
F = +3.0523775E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +6.6796309E+01

R = +8.0999371E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +6.9165521E-01

ι = +5.5248326E+00 SIGNIFICANCE OF ι = SIGNIFICANT S_E = +4.0377502E+01

N = 18 DEGREES OF FREEDOM = 16

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = T/TEMP=020 DEG F



II STAGE DSCT MTRS,OUTER,LOW RATE,CHS=2.0 IN/MIN,T/PRES=500 PSI, MAX STRESS

Figure 37

Y = ((+1.0001766E+00) + (-3.6922901E-03) * X)

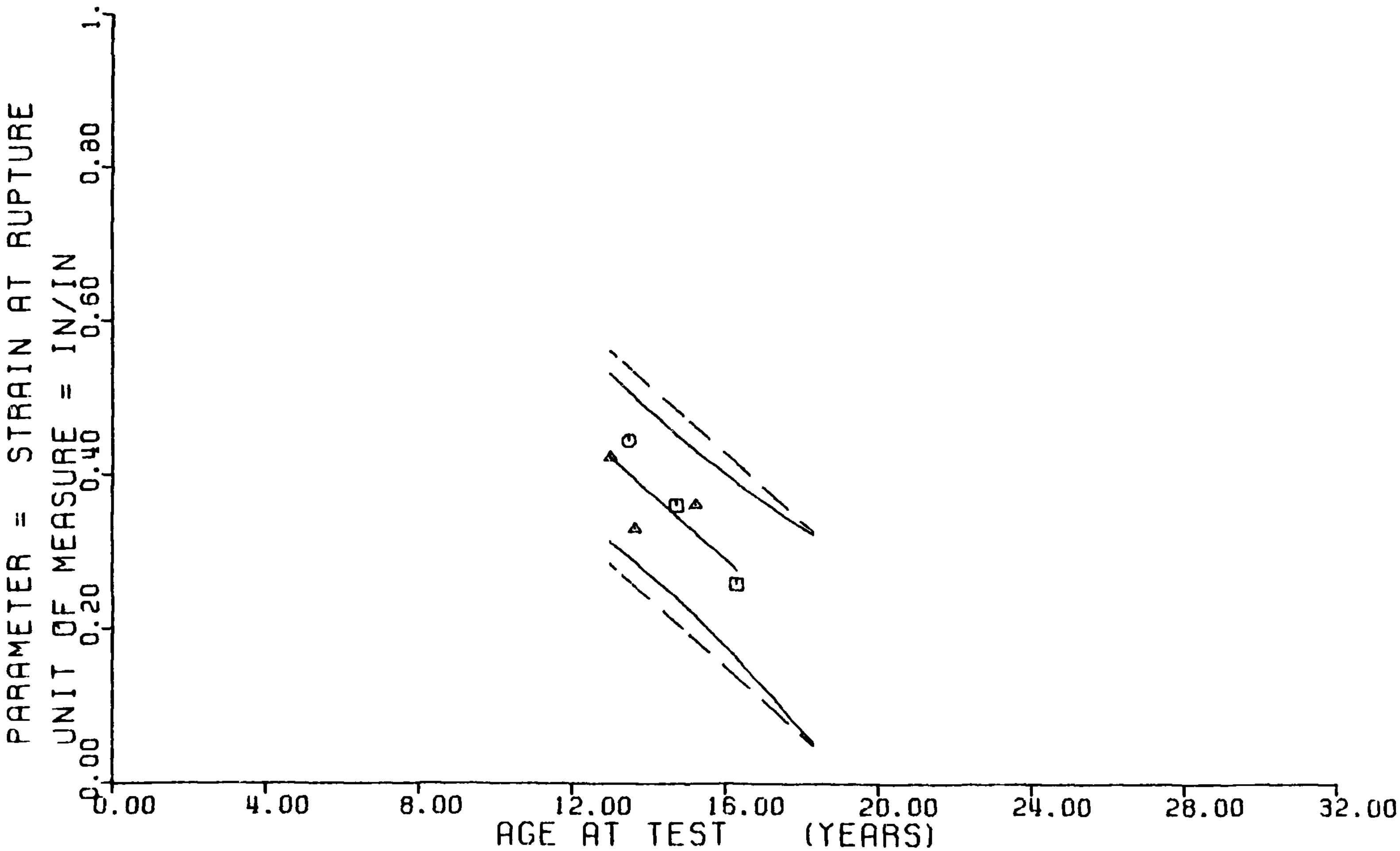
F = +2.1150727E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +6.9347046E-02

R = -7.6489907E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +8.0284769E-04

t = +4.5989920E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +4.6134884E-02

N = 17 DEGREES OF FREEDOM = 15

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = T/TEMP=020 DEG (F



II STAGE DSCT MTRS,OUTER,LOW RATE,CHS=2.0 IN/MIN,T/PRES=500 PSI, STRN/RUPT

Figure 38

AD-A089 158 OGDEN AIR LOGISTICS CENTER HILL AFB UT PROPELLANT ANA--ETC F/G 21/8.2
LGM-30B, STAGE II DISSECTED MOTORS TEST REPORT,(U)
JUL 80 D ANDERSON
UNCLASSIFIED MAKPH-443(80) NL

2 OF 2
AD A089158

END
DATE FILMED
10-80
DTIC

Y = ((-9.8974318E+03) + (+8.1847711E+01) * X)

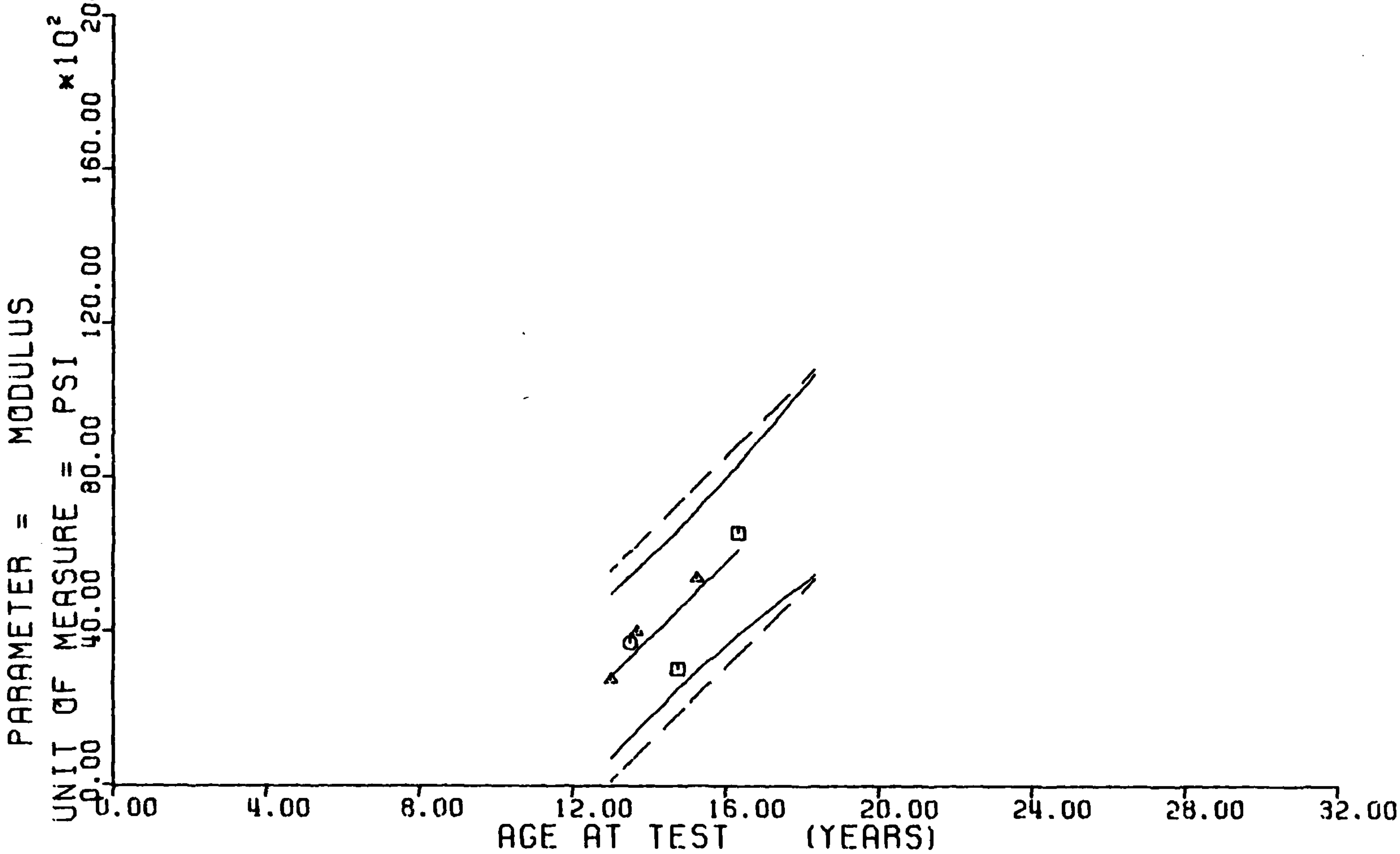
F = +2.7617119E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +1.4563681E+03

R = +7.9572078E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +1.5574615E+01

t = +5.2551993E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +9.0921614E+02

N = 18 DEGREES OF FREEDOM = 16

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = T/TEMP=020 DEG(F



II STAGE DSCT MTRS,OUTER,LOW RATE,CHS=2.0 IN/MIN,T/PRES=500 PSI, MODULUS

Figure 39

Y = ((-8.1660894E+01) + (+3.2330888E+00) * X)

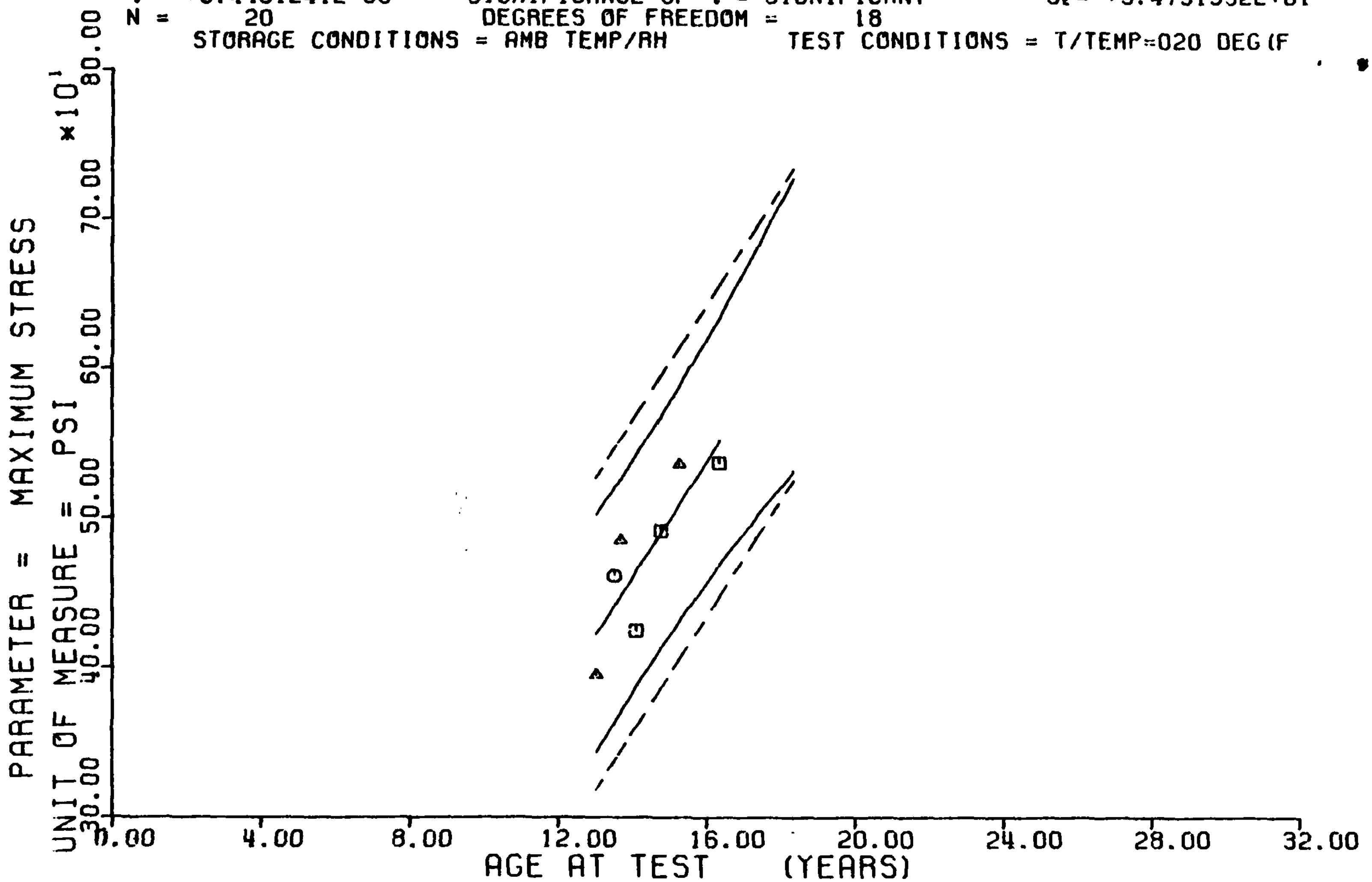
F = +2.9594950E+01   SIGNIFICANCE OF F = SIGNIFICANT σ_y = +5.5065829E+01

R = +7.8854842E-01   SIGNIFICANCE OF R = SIGNIFICANT S_b = +5.9430423E-01

t = +5.4401241E+00   SIGNIFICANCE OF t = SIGNIFICANT S_E = +3.4791932E+01

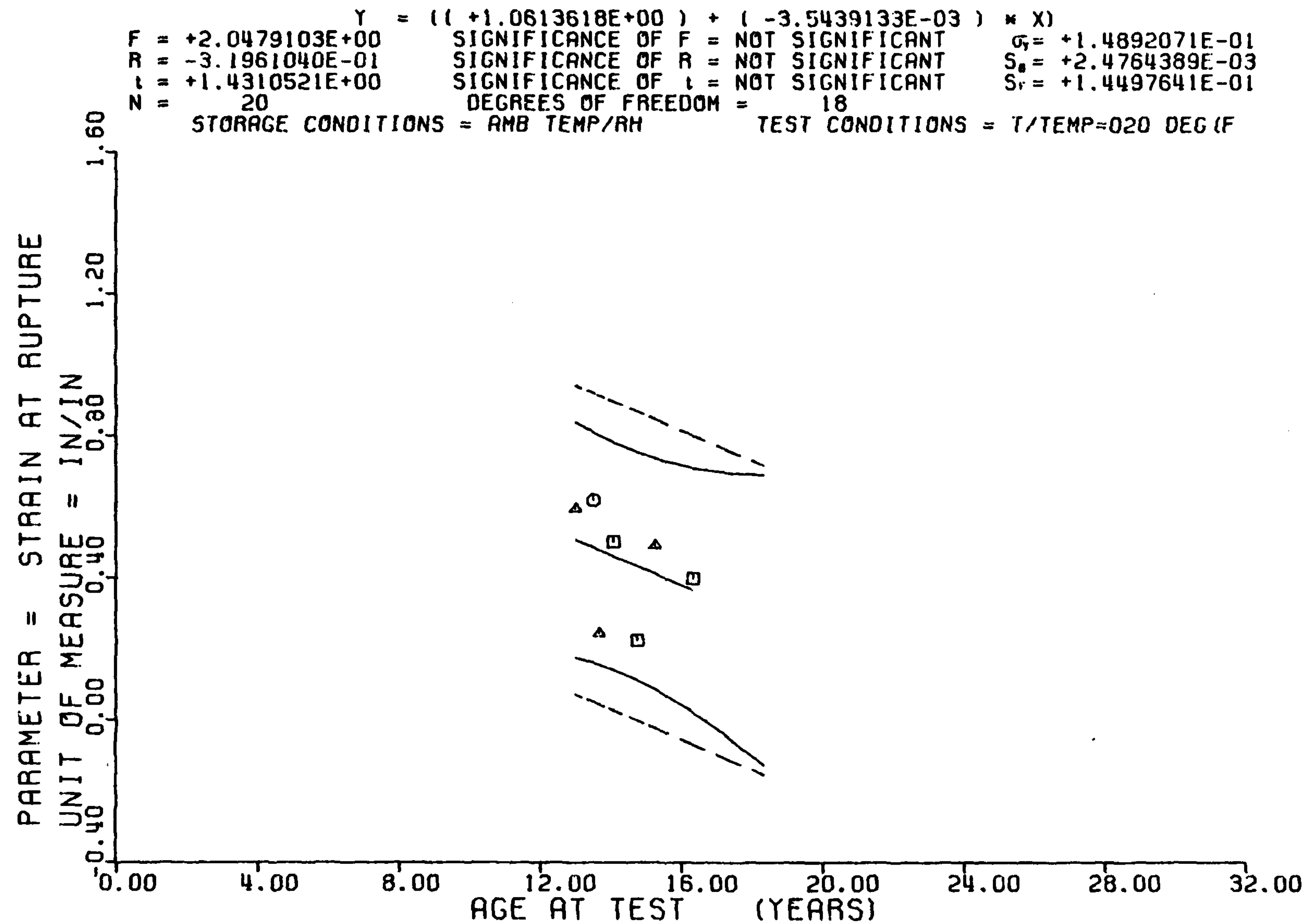
N = 20   DEGREES OF FREEDOM = 18

STORAGE CONDITIONS = AMB TEMP/RH   TEST CONDITIONS = T/TEMP=020 DEG(F



II STAGE DSCT MTRS, INNER, LOW RATE, CHS=2.0 IN/MIN, T/PRES=500 PSI, MAX STRESS

Figure 40



II STAGE DSCT MTRS, INNER, LOW RATE, CHS=2.0 IN/MIN, T/PRES=500 PSI, STRN/RUPT

Figure 41

Y = ((-6.8466924E+03) + (+6.4883811E+01) * X)

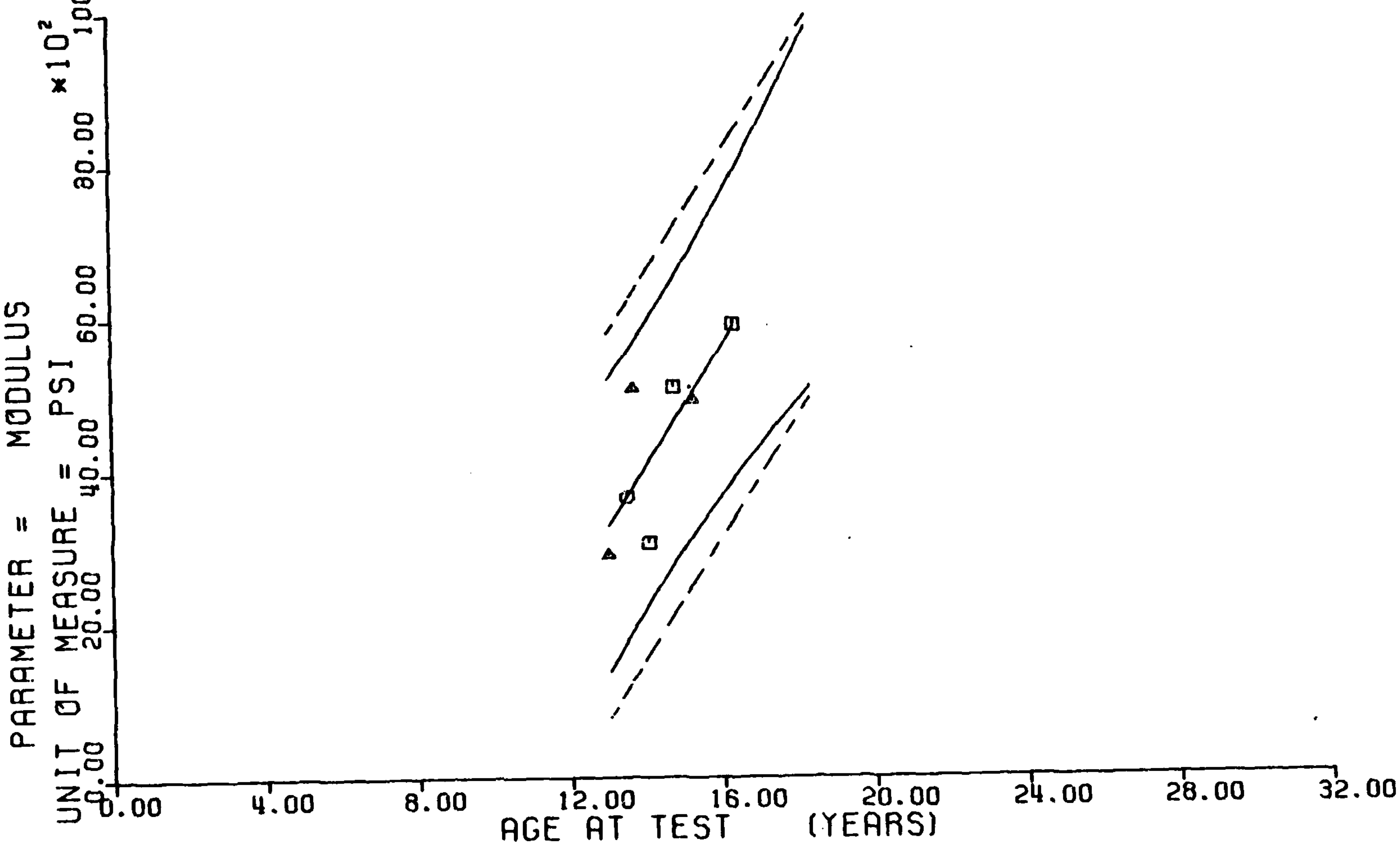
F = +2.0818008E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +1.1899434E+03

R = +7.3232348E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +1.4220562E+01

t = +4.5626755E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +8.3250431E+02

N = 20 DEGREES OF FREEDOM = 18

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = T/TEMP=020 DEG(F



II STAGE OSCT MTRS, INNER, LOW RATE, CHS=2.0 IN/MIN, T/PRES=500 PSI, MODULUS

Figure 42

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
117.0	10	+5.0579980E+02	+1.8140194E+01	+5.3400000E+02	+4.8500000E+02	+4.5268017E+02
124.0	8	+4.7163989E+02	+3.2672605E+01	+5.1744995E+02	+4.2952978E+02	+4.6299218E+02
131.0	11	+4.2857934E+02	+6.9663695E+01	+5.0742993E+02	+3.0756982E+02	+4.7330395E+02
137.0	3	+3.3146972E+02	+1.1748934E+01	+3.4443994E+02	+3.2154980E+02	+4.8214282E+02
148.0	3	+5.4205981E+02	+2.1834794E+00	+5.4407983E+02	+5.3983984E+02	+4.9834716E+02
155.0	3	+5.1894311E+02	+6.1236293E+00	+5.2518994E+02	+5.1295996E+02	+5.0865917E+02
161.0	3	+5.3964306E+02	+2.1730326E+00	+5.4207983E+02	+5.3830981E+02	+5.1749780E+02
168.0	3	+5.3674316E+02	+5.2441832E+00	+5.4028979E+02	+5.3072998E+02	+5.2780981E+02
181.0	3	+5.3312304E+02	+2.6153435E+00	+5.3578979E+02	+5.3061987E+02	+5.4696044E+02
183.0	6	+5.7155468E+02	+7.2569809E+00	+5.8110986E+02	+5.6230981E+02	+5.4990673E+02

II STAGE DSCT MTRS.OUTER.AXIAL.H.R.HYDRO.CHS=1750 AT 500 PSI.MAXIMUM STRESS

This sample size summary is applicable to figures 43 thru 48

Y = ((+2.8032417E+02) + (+1.4731291E+00) * X)

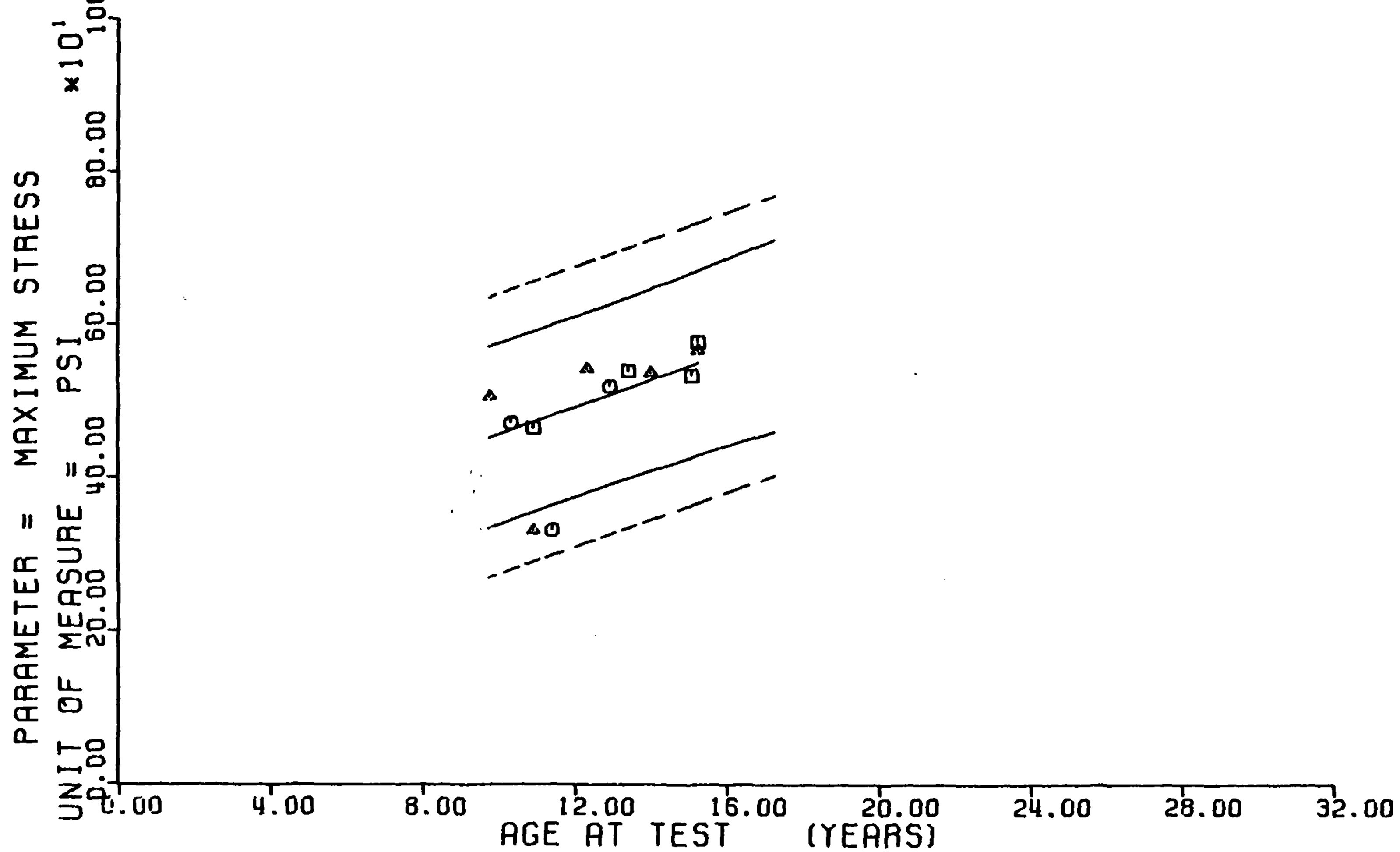
F = +1.6689030E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +6.9590643E+01

R = +4.9654247E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +3.6059963E-01

ι = +4.0852209E+00 SIGNIFICANCE OF ι = SIGNIFICANT S_E = +6.0994879E+01

N = 53 DEGREES OF FREEDOM = 51

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTRS,OUTER,AXIAL,H.R.HYDRO.CHS=1750 AT 500 PSI,MAXIMUM STRESS

Figure 43

Y = ((+3.9552808E-01) + (+2.6244359E-04) * X)

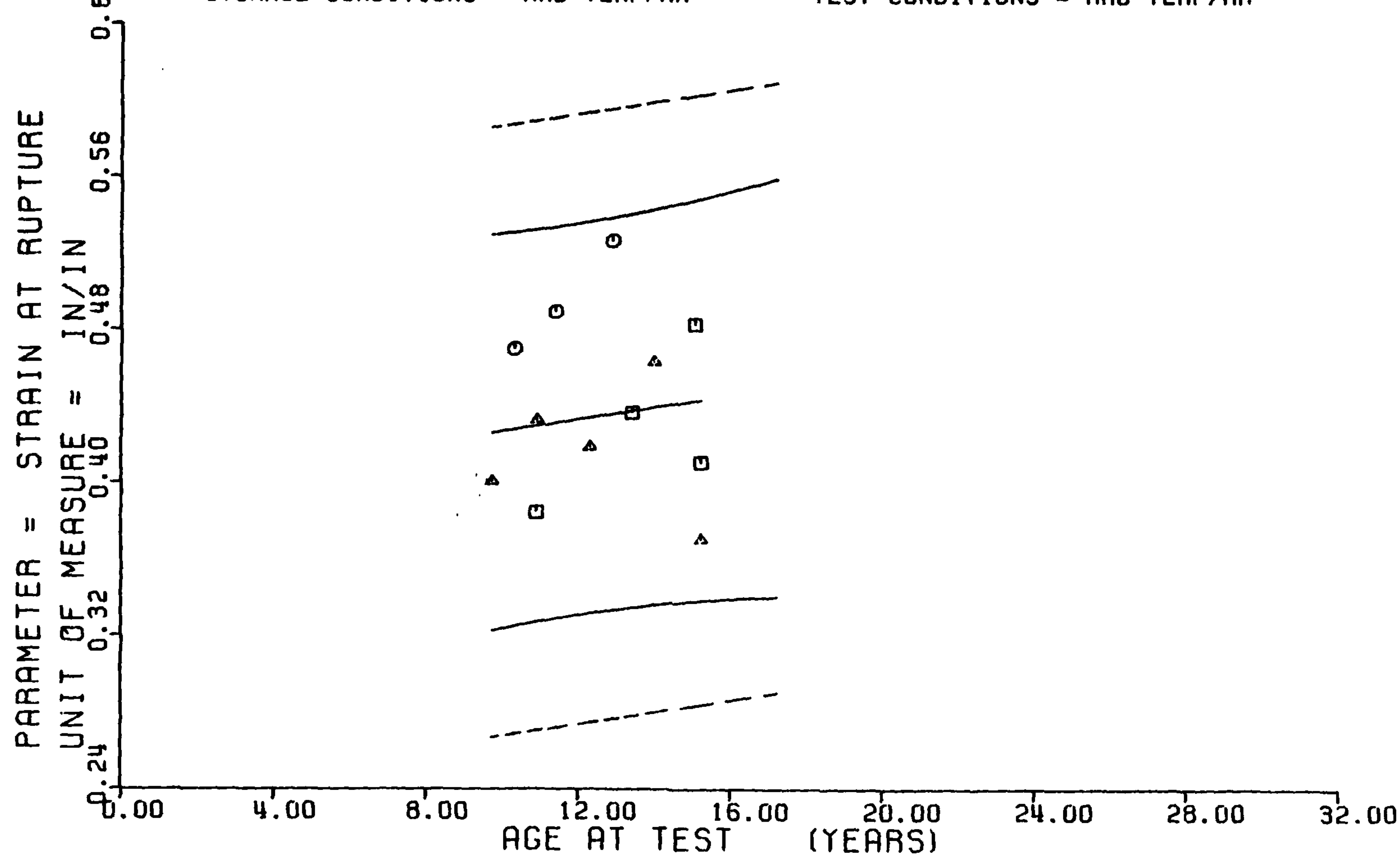
F = +6.9715887E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y = +5.3011472E-02

R = +1.1612682E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT S_a = +3.1431861E-04

t = +8.3496040E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT S_ε = +5.3166515E-02

N = 53 DEGREES OF FREEDOM = 51

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTRS,OUTER,AXIAL,H.R.HYDRO.CHS=1750 AT 500 PSI,STRAIN/RUPTURE

Figure 44

Y = ((+8.4925124E+02) + (+2.6920763E+01) * X)

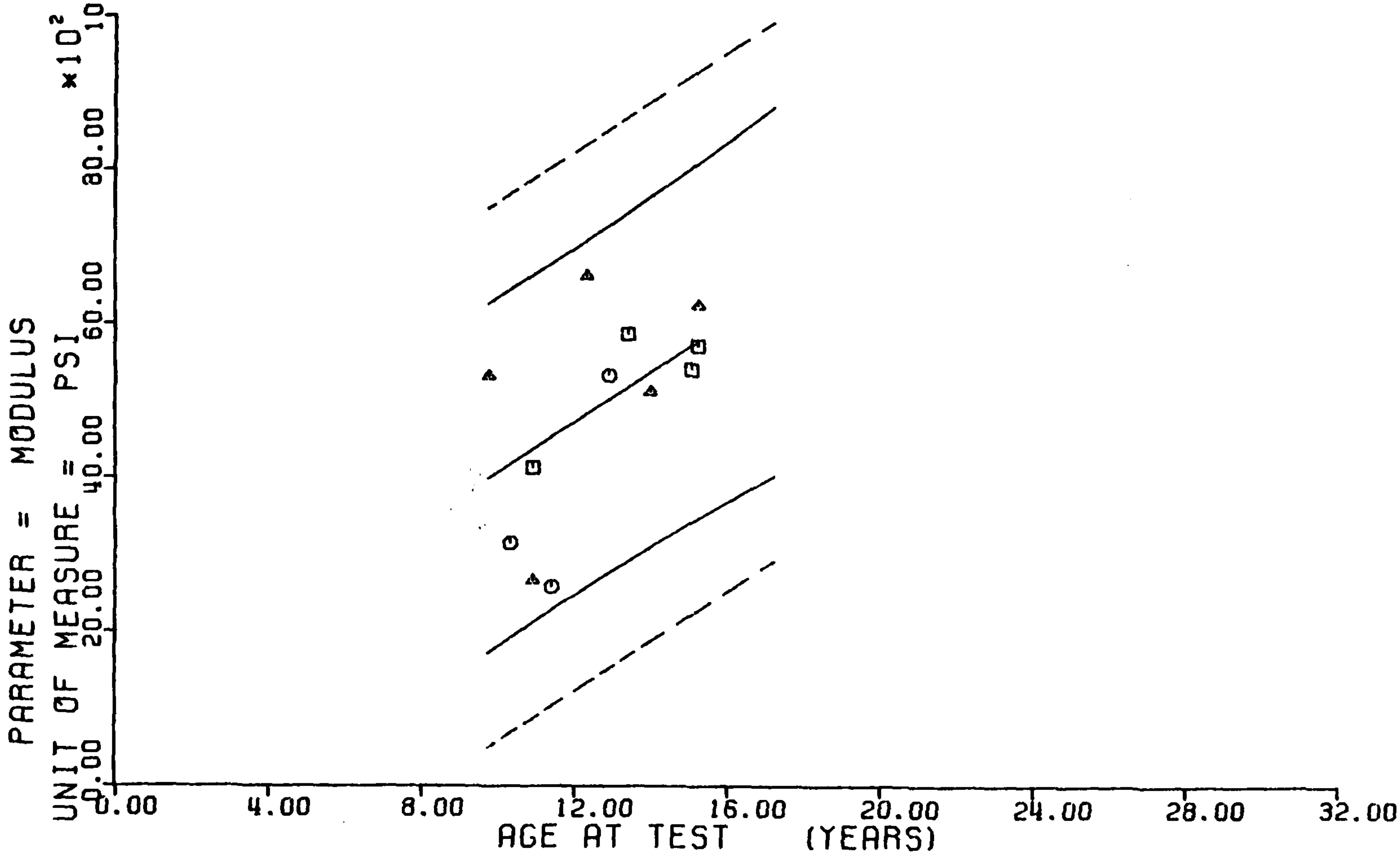
F = +1.5198327E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +1.3178907E+03

R = +4.7915319E-01 SIGNIFICANCE OF R = SIGNIFICANT S_β = +6.9054100E+00

t = +3.8985032E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +1.1680396E+03

N = 53 DEGREES OF FREEDOM = 51

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE OSCT MTRS, OUTER, AXIAL, H.R.HYDRO.CHS=1750 AT 500 PSI, MODULUS

Figure 45

Y = ((+3.0106091E+02) + (+1.3526042E+00) * X)

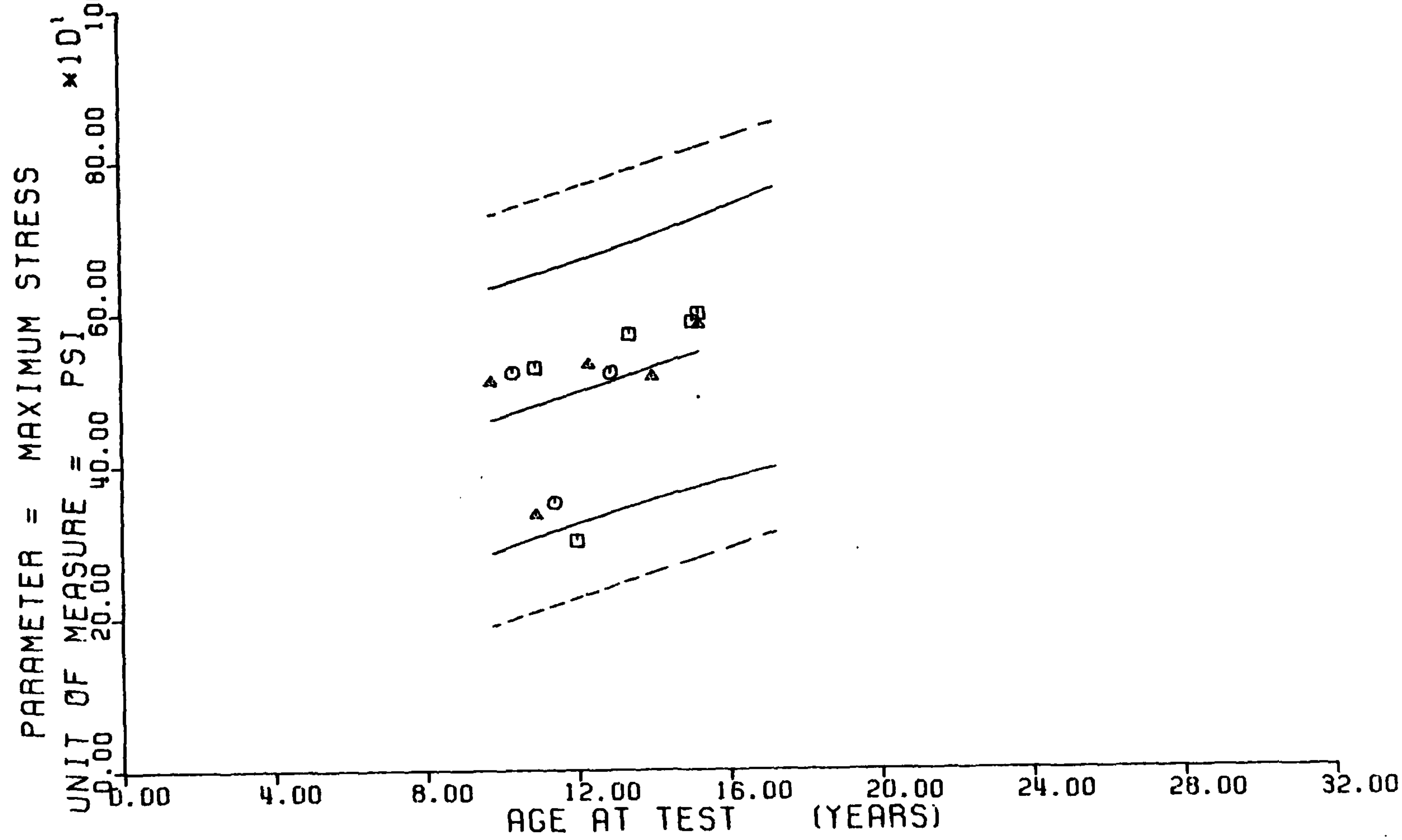
F = +6.1639275E+00 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +9.4011206E+01

R = +3.2008157E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +5.4480612E-01

t = +2.4827258E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +8.9886171E+01

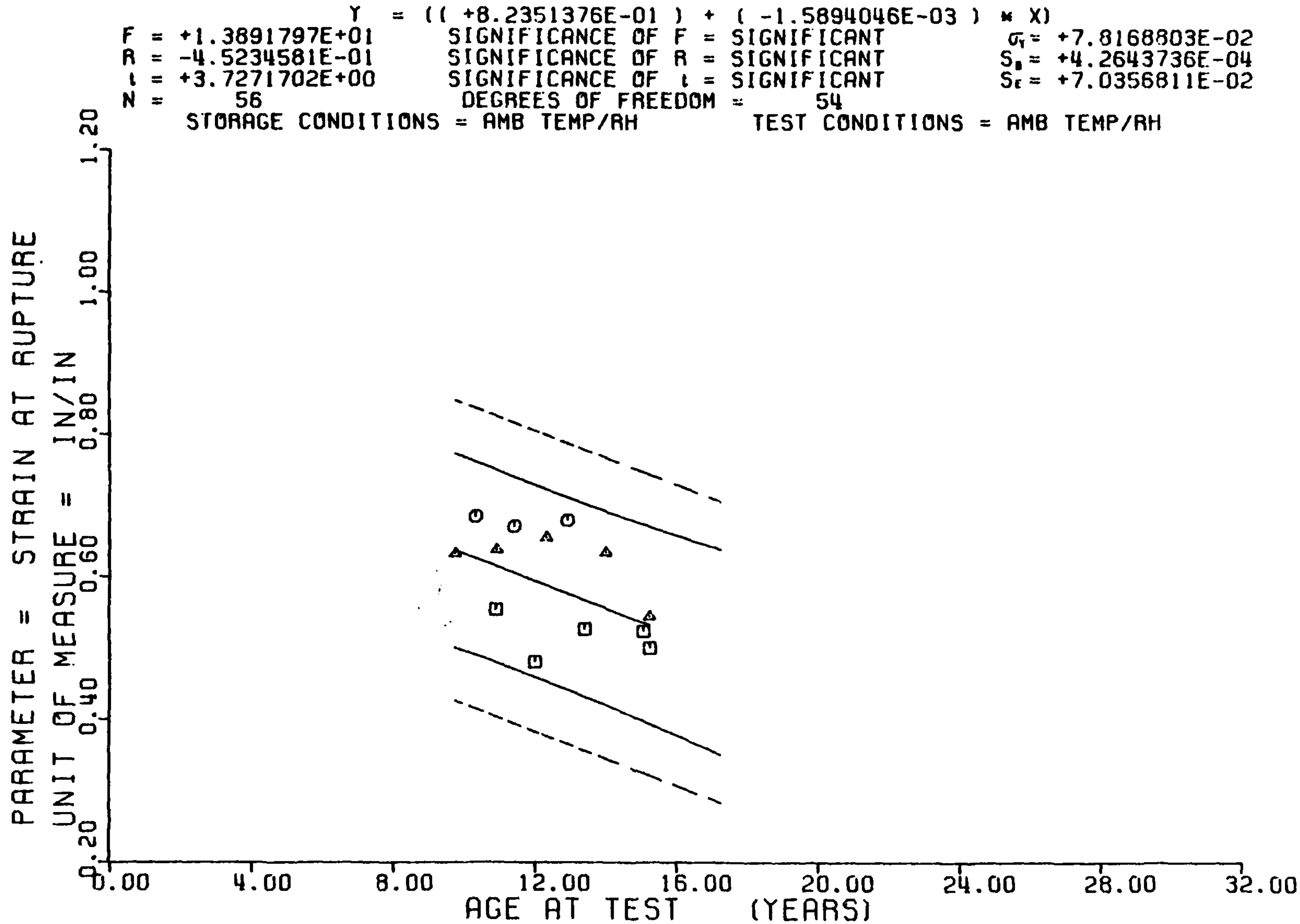
N = 56 DEGREES OF FREEDOM = 54

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTRS, INNER, AXIAL, H.R.HYDRO.CHS=1750 AT 500 PSI, MAXIMUM STRESS

Figure 46

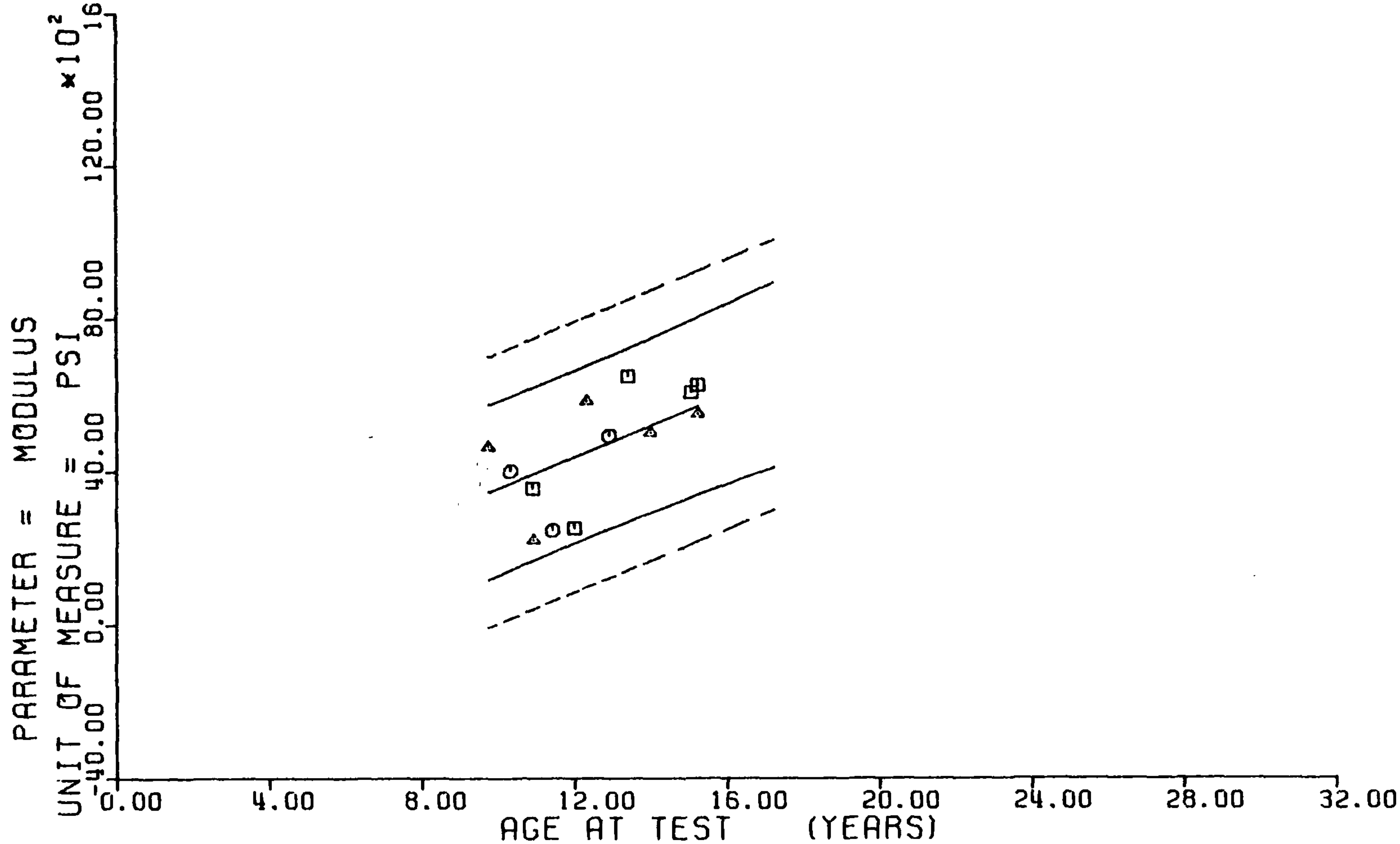


II STAGE DSCT MTRS, INNER, AXIAL, H.R. HYDRO. CHS=1750 AT 500 PSI, STRAIN/RUPTURE

Figure 47

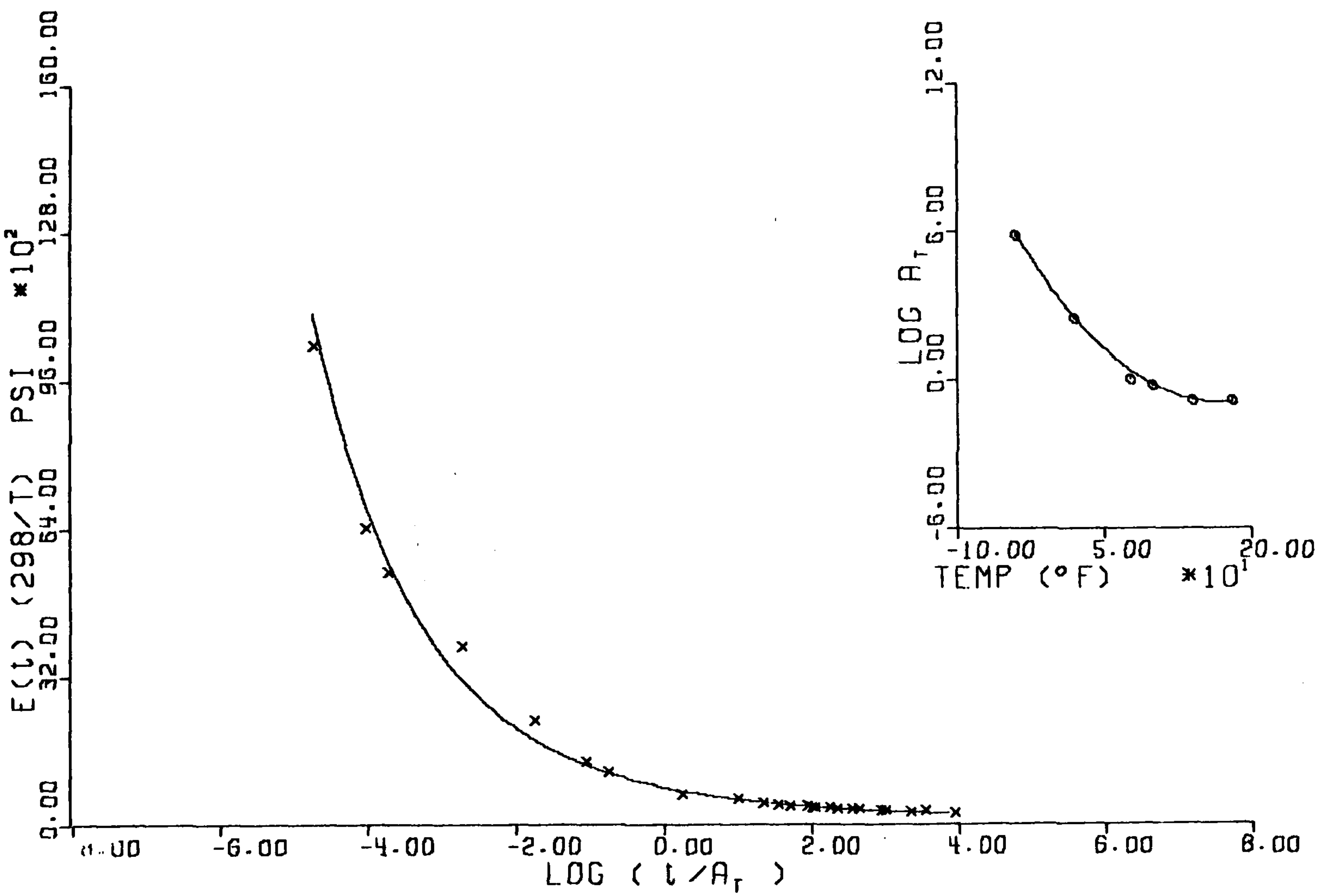
$Y = ((-5.3291158E+02) + (+3.4174173E+01) * X)$

F = +2.2966781E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +1.3917754E+03
R = +5.4625874E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +7.1309591E+00
t = +4.7923669E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +1.1765187E+03
N = 56 DEGREES OF FREEDOM = 54
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



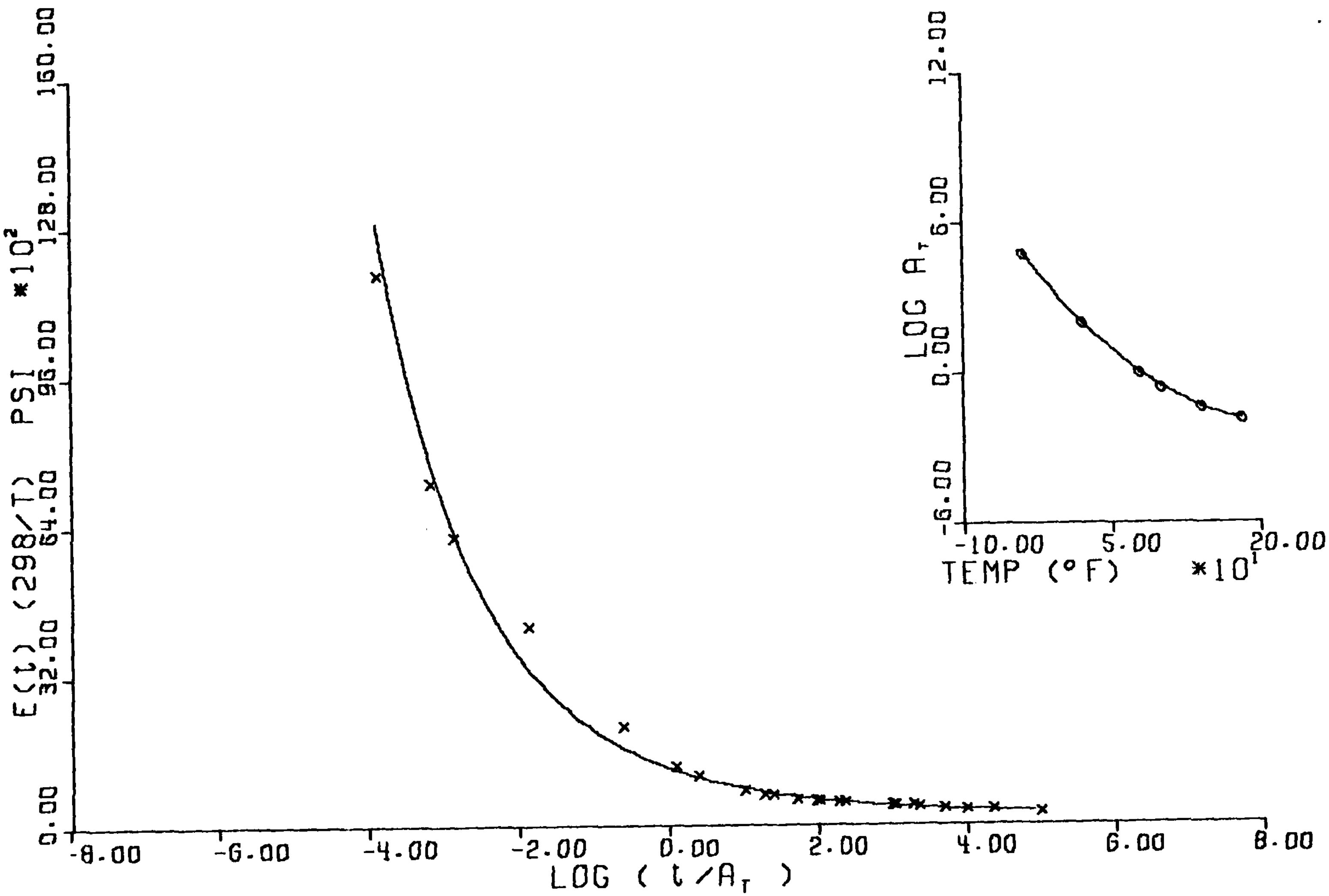
II STAGE DSCT MTRS, INNER, AXIAL, H.R. HYDRO. CHS=1750 AT 500 PSI, MODULUS

Figure 48



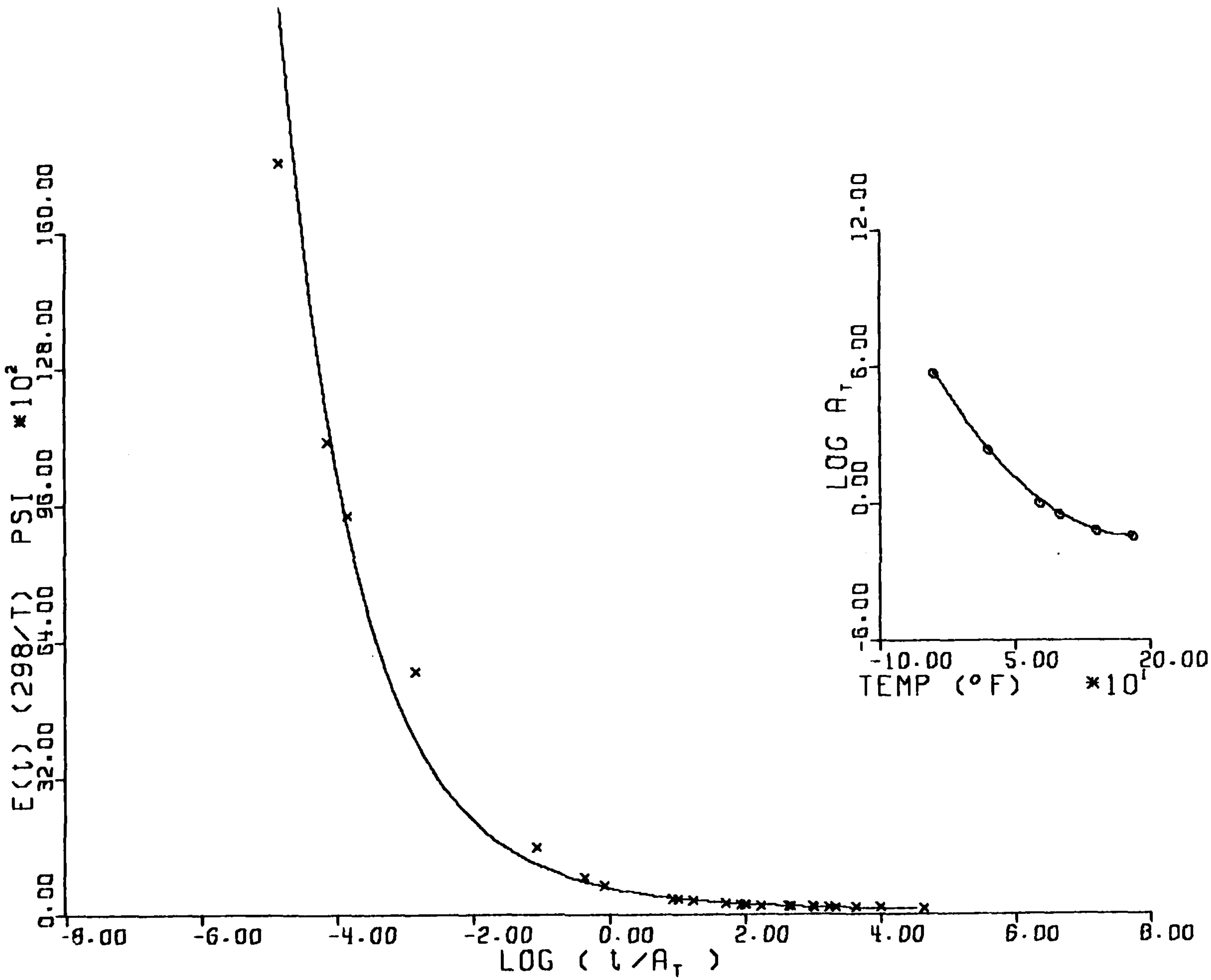
ANP-2864 (INNER). 3% STRAIN MASTER STRESS RELAXATION PLOT. MOTOR 0022135

Figure 49



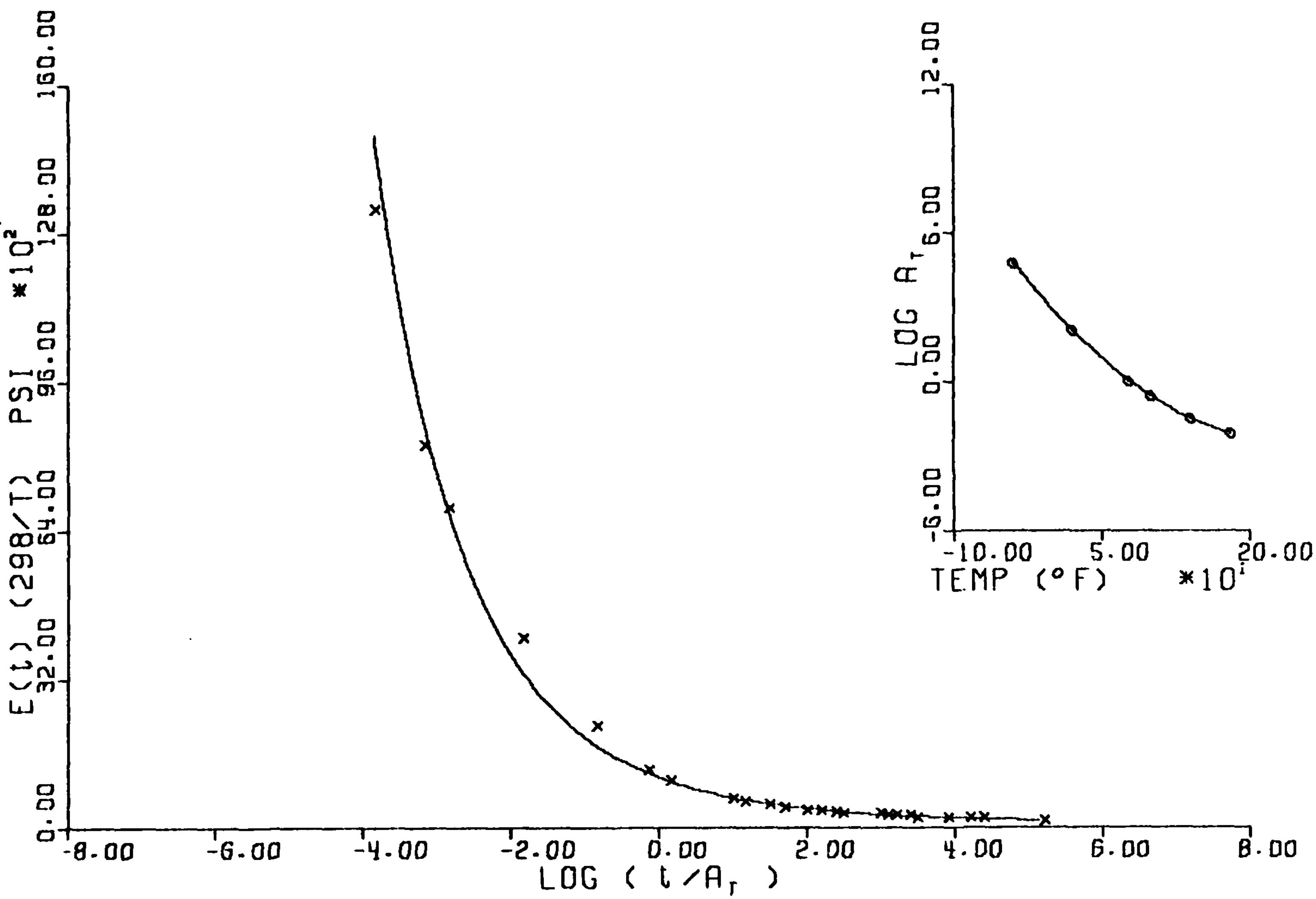
ANP-2862 (OUTER). 3% STRAIN MASTER STRESS RELAXATION PLOT. MOTOR 0022135

Figure 50



ANP-2864 (INNER). 3% STRAIN MASTER STRESS RELAXATION PLOT. MOTOR 0022788

Figure 51



ANP-2862 (OUTER), 3% STRAIN MASTER STRESS RELAXATION PLOT, MOTOR 0022788

Figure 52

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
130.0	3	+3.7617654E+00	+3.5221226E-01	+4.0023994E+00	+3.3574991E+00	+3.4943447E+00
136.0	3	+3.4696989E+00	+6.9519551E-01	+4.2616996E+00	+2.9602994E+00	+3.5920076E+00
143.0	3	+5.0410652E+00	+3.8446995E-01	+5.4213991E+00	+4.6525993E+00	+3.7059469E+00
150.0	3	+2.6618661E+00	+1.6363107E-01	+2.8067998E+00	+2.4843997E+00	+3.8198862E+00
156.0	3	+5.0434322E+00	+5.5652490E-01	+5.4921998E+00	+4.4206991E+00	+3.9175481E+00
164.0	6	+3.1336975E+00	+5.0689597E-01	+3.6486997E+00	+2.4558992E+00	+4.0477647E+00
178.0	3	+2.8325662E+00	+7.3182087E-01	+3.4563999E+00	+2.0269994E+00	+4.2756433E+00
183.0	3	+5.2521324E+00	+1.1665460E+00	+6.5078992E+00	+4.2021999E+00	+4.3570280E+00
196.0	3	+5.4966325E+00	+1.4821111E+00	+7.1818990E+00	+4.3959999E+00	+4.5686292E+00

II STAGE DSCT MTRS,INNER,TEAR ENERGY,X-HD/SPEED=1.0 IN/MIN,T/TEMP=40 DEG(F).

This sample size summary is applicable to figures 53 thru 68

Y = ((+2.0844062E+00) + (+7.5760925E-03) * X)

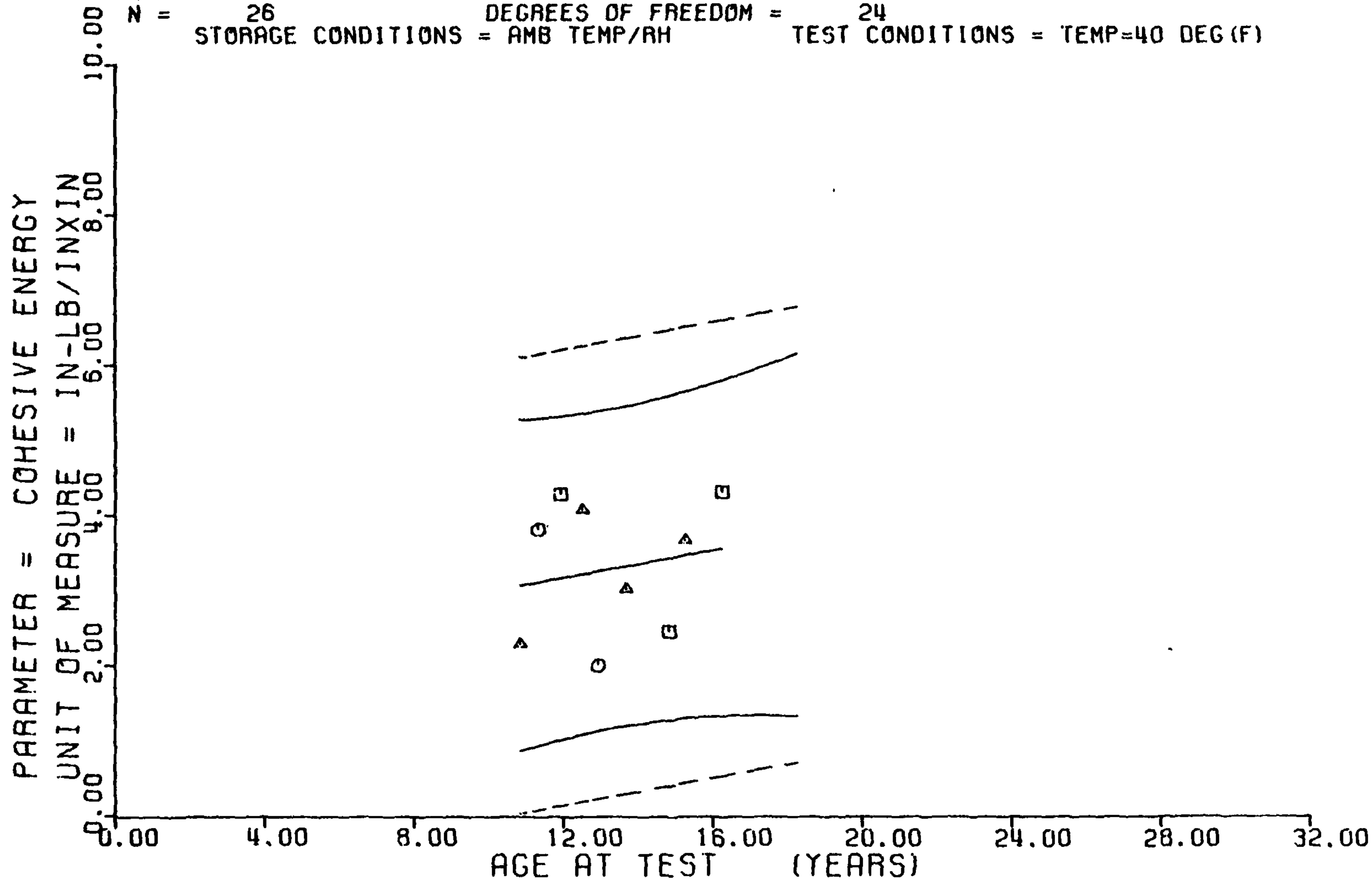
F = +6.6578652E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y = +1.0039358E+00

R = +1.6429336E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT S_B = +9.2849115E-03

t = +8.1595742E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT S_t = +1.0107144E+00

N = 26 DEGREES OF FREEDOM = 24

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = TEMP=40 DEG (F)



II STAGE DSCT MTRS, OUTER, TEAR ENERGY, X-HD/SPEED=1.0 IN/MIN, T/TEMP=40 DEG (F).

Figure 53

Y = ((+1.8130411E+00) + (+1.0062335E-03) * X)

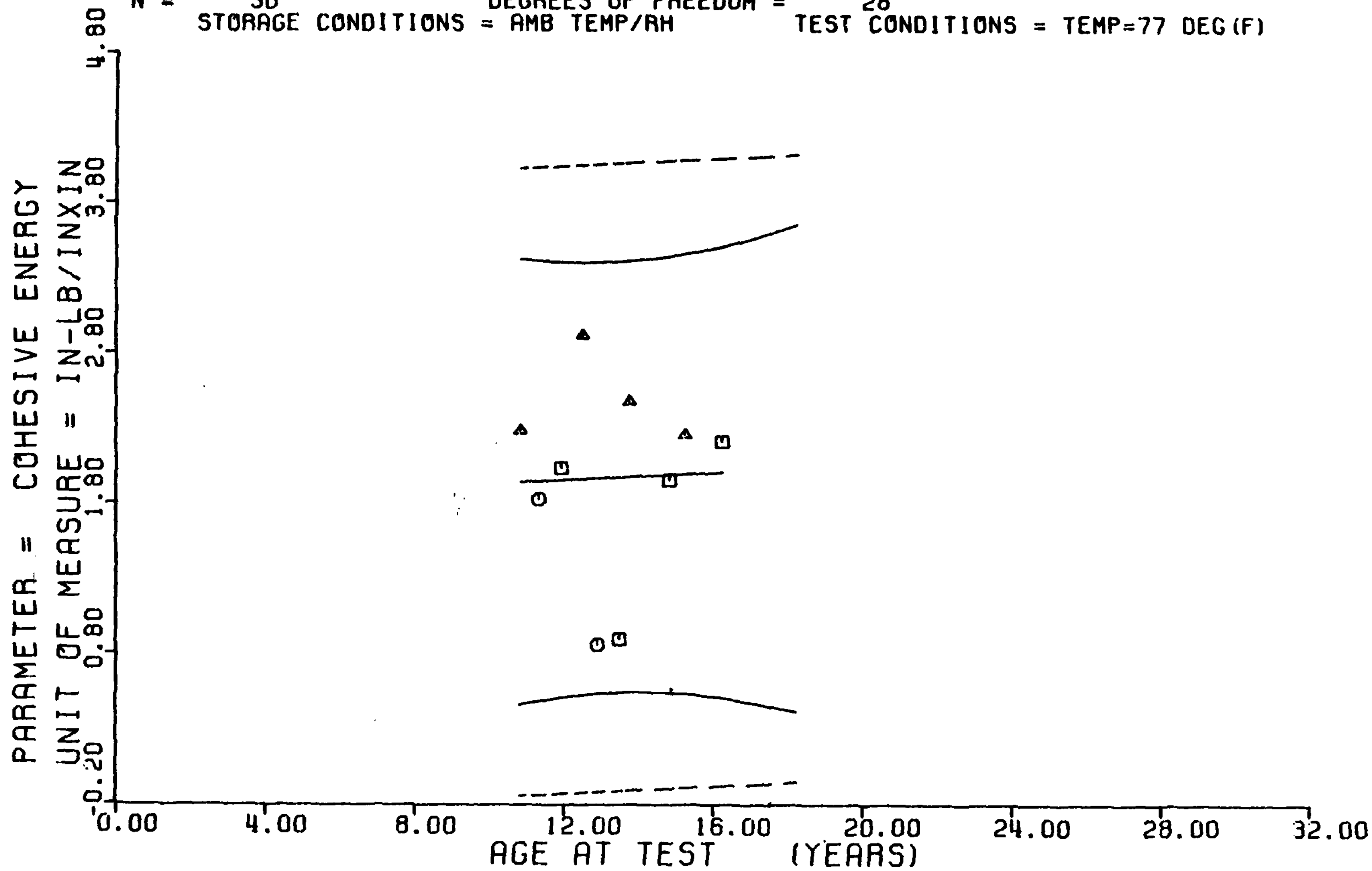
F = +2.5033034E-02 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y = +6.8453364E-01

R = +2.9887093E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT S_β = +6.3597794E-03

ι = +1.5821831E-01 SIGNIFICANCE OF ι = NOT SIGNIFICANT S_ε = +6.9633922E-01

N = 30 DEGREES OF FREEDOM = 28

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = TEMP=77 DEG(F)



II STAGE DSCT MTRS, OUTER, TEAR ENERGY, X-HD/SPEED=1.0 IN/MIN, T/TEMP=77 DEG(F).

Figure 54

Y = ((+7.3850491E-01) + (+4.5892663E-03) * X)

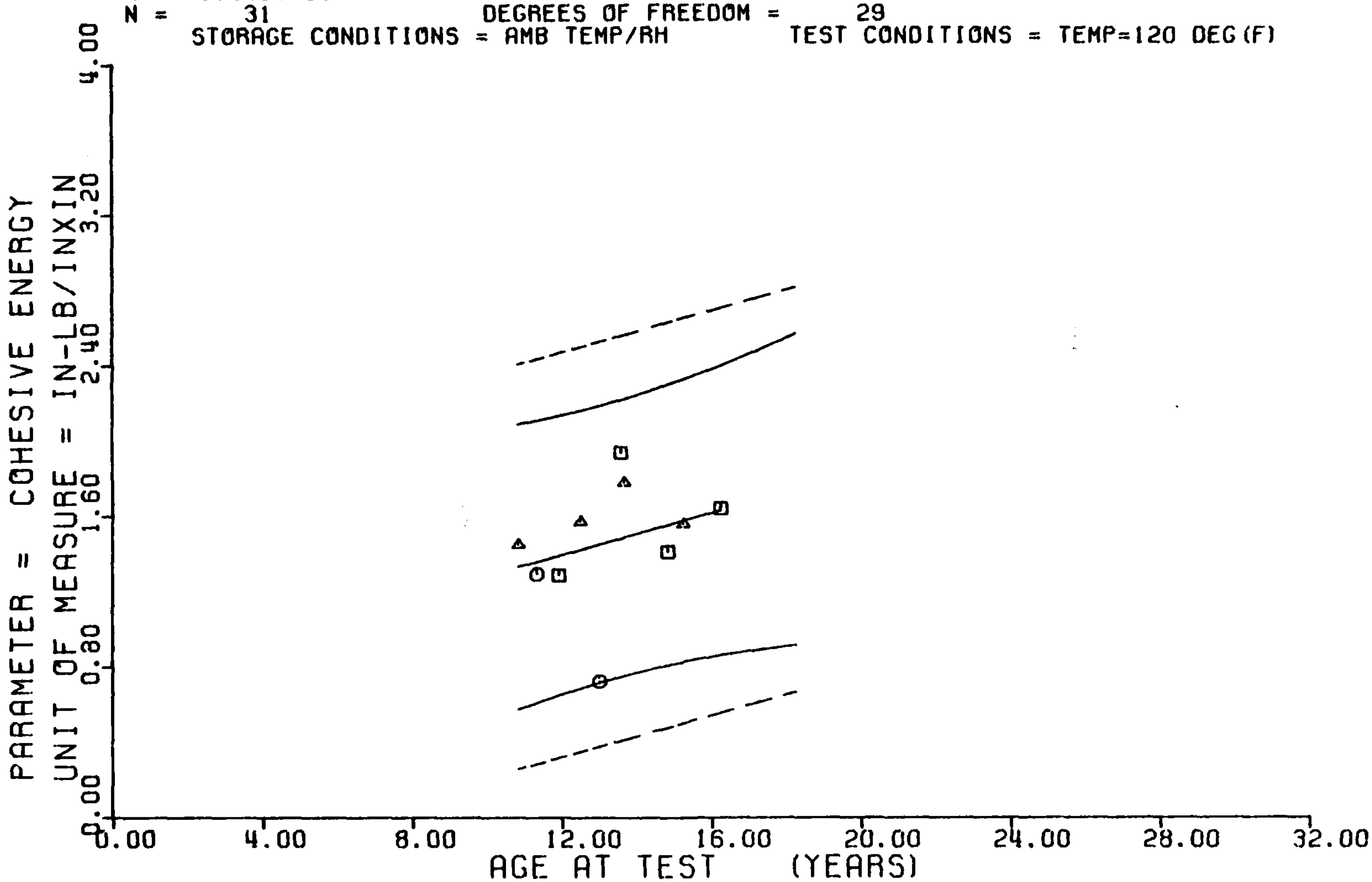
F = +2.1021916E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y = +3.6477060E-01

R = +2.5998042E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT S_B = +3.1652434E-03

t = +1.4498936E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT S_E = +3.5824897E-01

N = 31 DEGREES OF FREEDOM = 29

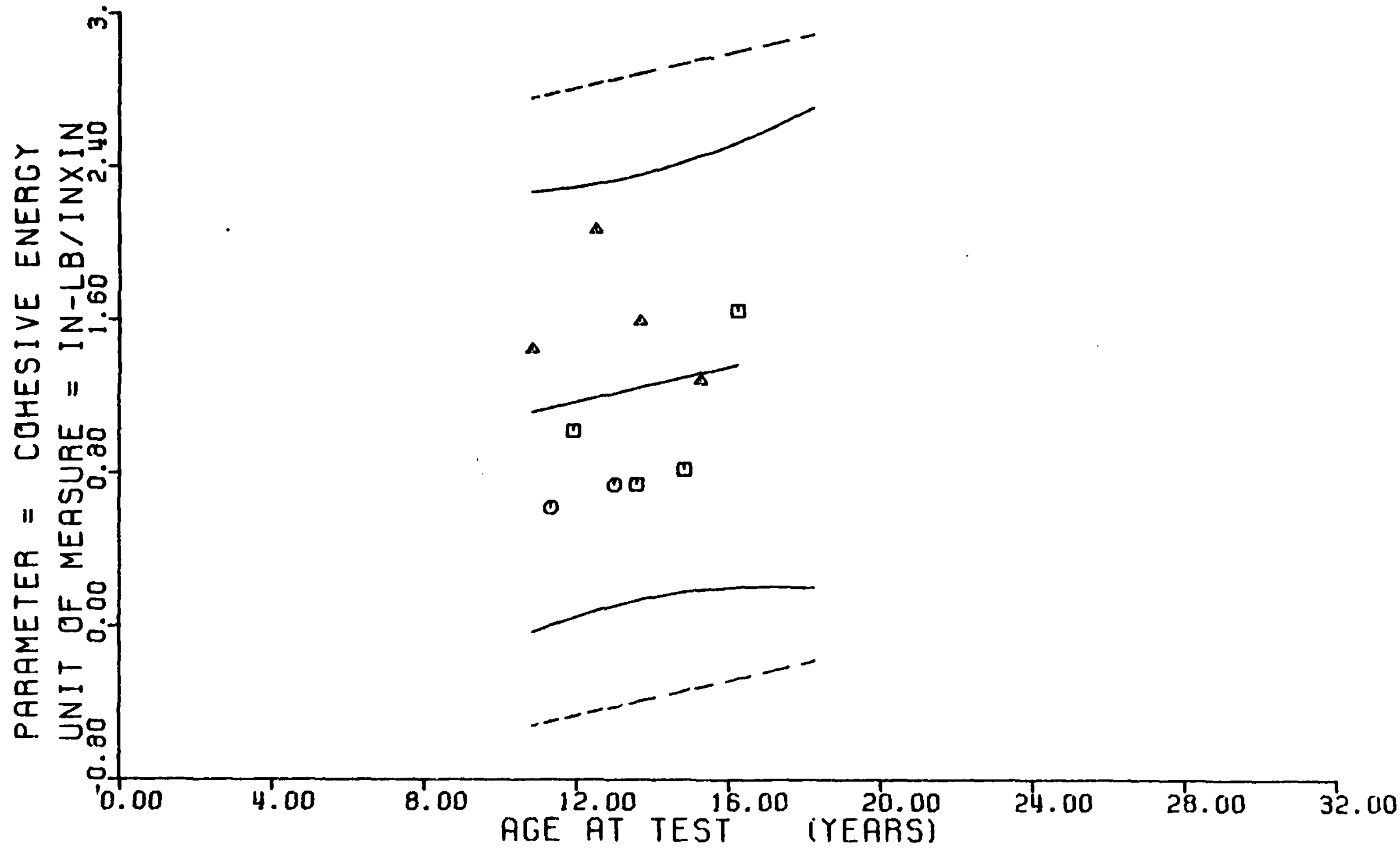
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = TEMP=120 DEG(F)



II STAGE DSCT MTRS,OUTER,TEAR ENERGY,X-HD/SPEED=1.0 IN/MIN,T/TEMP=120 DEG(F).

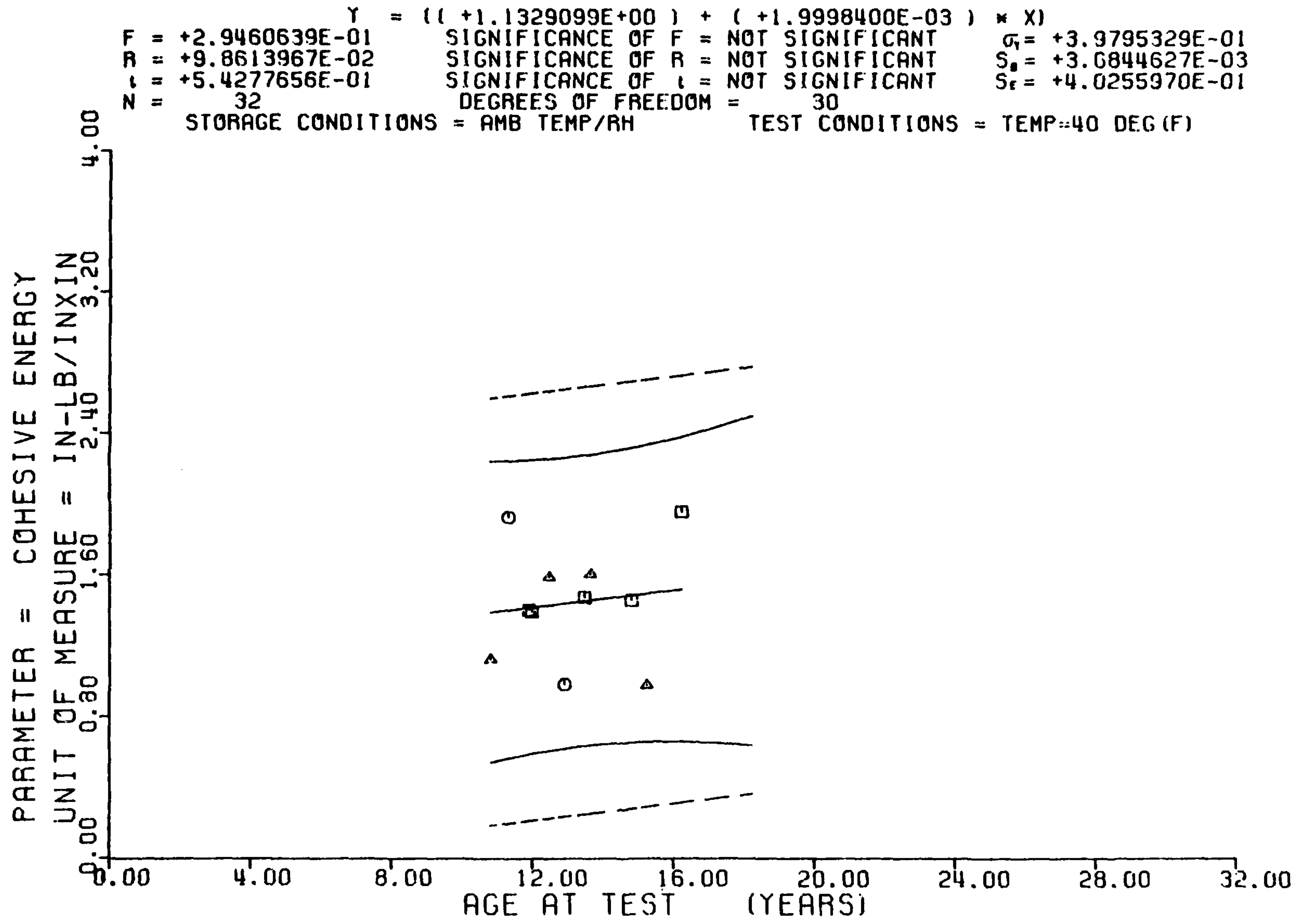
Figure 55

Y = ((+6.1982748E-01) + (+3.8131277E-03) * X)
F = +5.8530815E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y = +5.4240978E-01
R = +1.3612870E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT S_B = +4.9841265E-03
t = +7.6505434E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT S_ϵ = +5.4595889E-01
N = 33 DEGREES OF FREEDOM = 31
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = TEMP=160 DEG(F)



II STAGE DSCT MTRS,OUTER,TEAR ENERGY,X-HD/SPEED=1.0 IN/MIN,T/TEMP=160 DEG(F).

Figure 56



II STAGE DSCT MTRS,OUTER,TEAR ENERGY,X-HD/SPEED=0.01 IN/MIN,T/TEMP=40 DEG(F).

Figure 57

Y = ((+8.4175652E-01) + (+1.3624093E-04) * X)

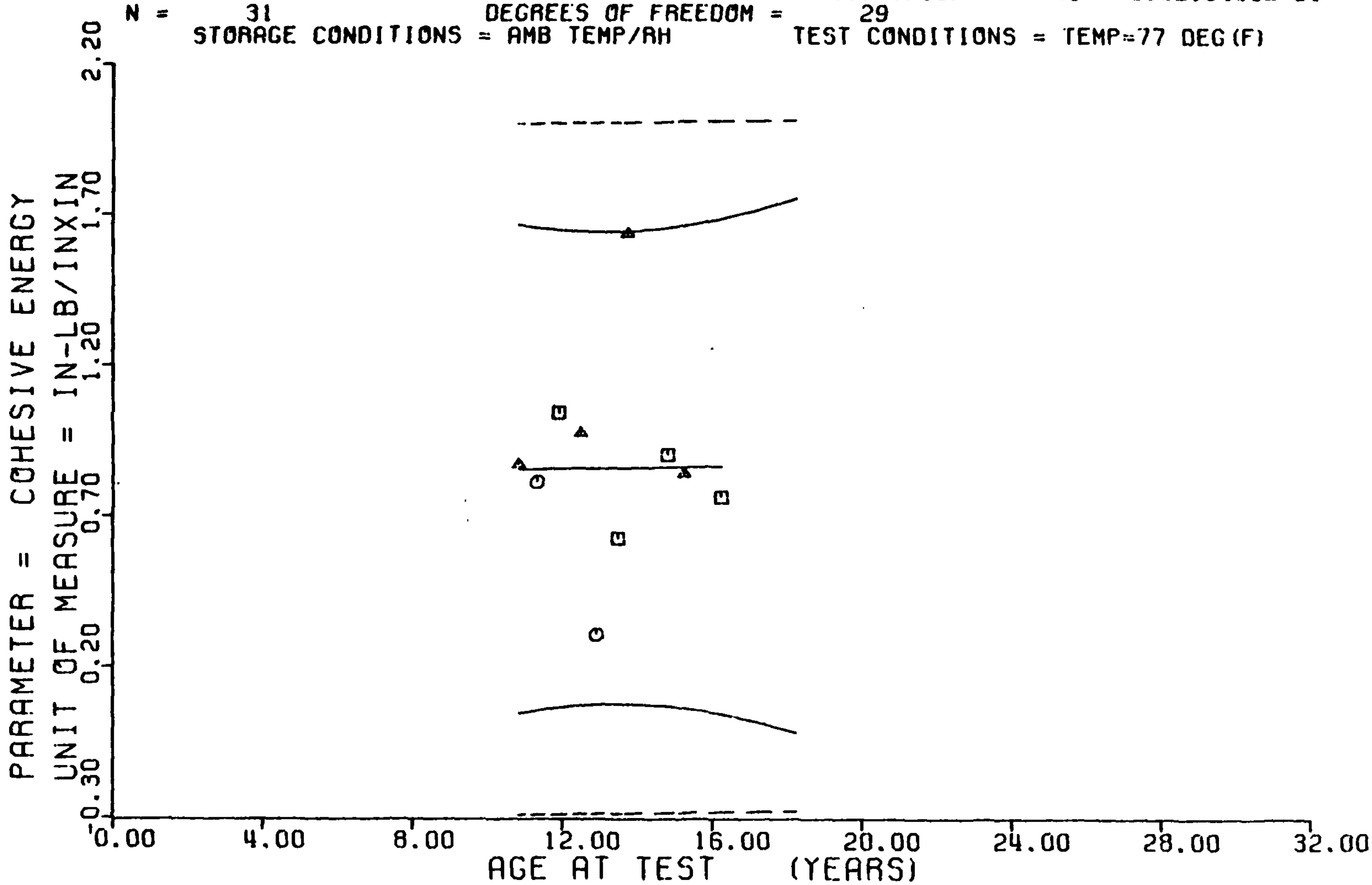
F = +1.5267988E-03 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y = +3.7569219E-01

R = +7.2557195E-03 SIGNIFICANCE OF R = NOT SIGNIFICANT S_B = +3.4867169E-03

t = +3.9074274E-02 SIGNIFICANCE OF t = NOT SIGNIFICANT S_E = +3.8210468E-01

N = 31 DEGREES OF FREEDOM = 29

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = TEMP=77 DEG (F)



II STAGE DSCT MTRS, OUTER, TEAR ENERGY, X-HD/SPEED=0.01 IN/MIN, T/TEMP=77 DEG (F).

Figure 58

Y = ((+5.5801366E-01) + (+4.7495220E-04) * X)

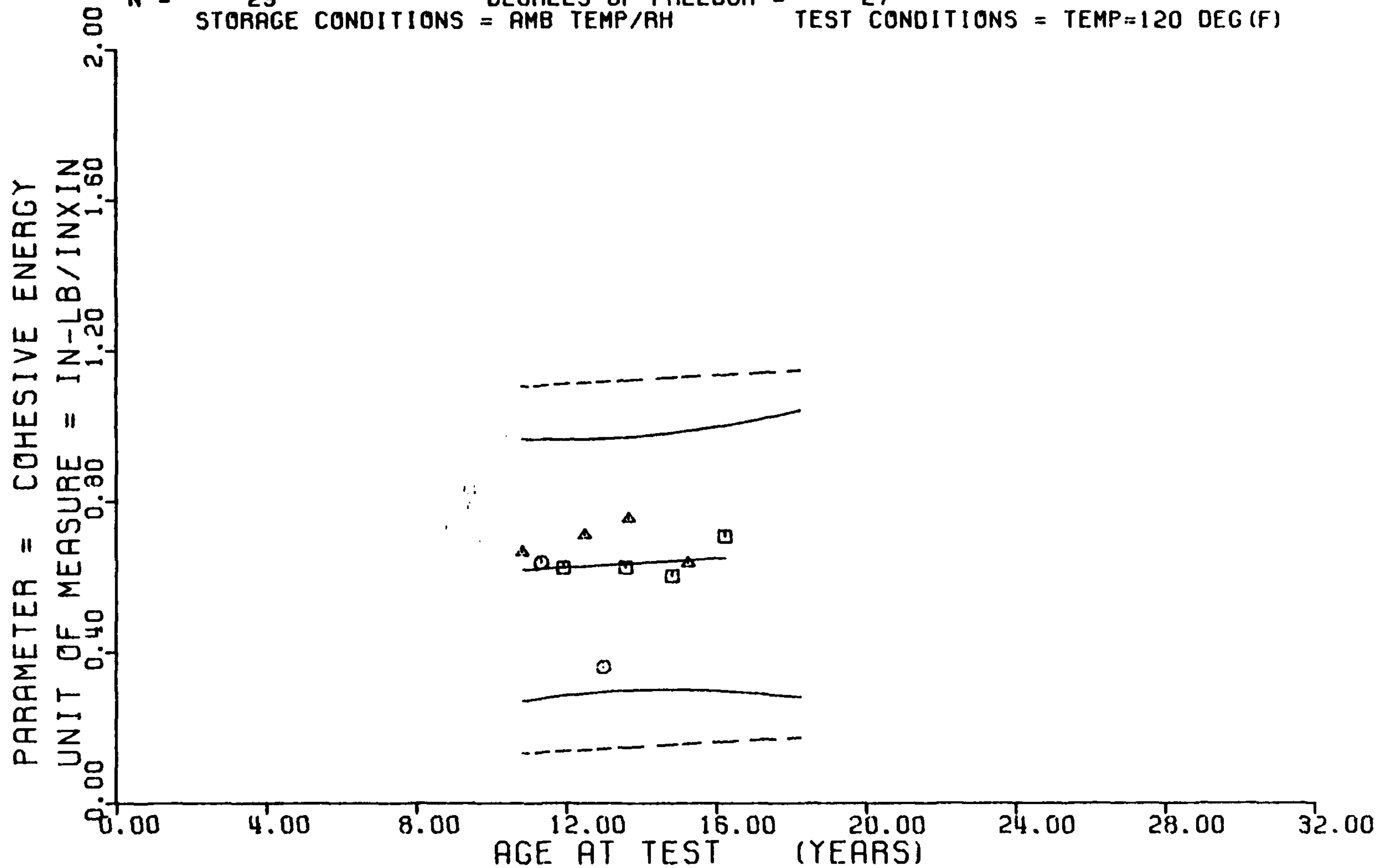
F = +1.0231096E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y = +1.5963160E-01

R = +6.1440951E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT S_B = +1.4848712E-03

t = +3.1986085E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT S_E = +1.6225374E-01

N = 29 DEGREES OF FREEDOM = 27

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = TEMP=120 DEG(F)



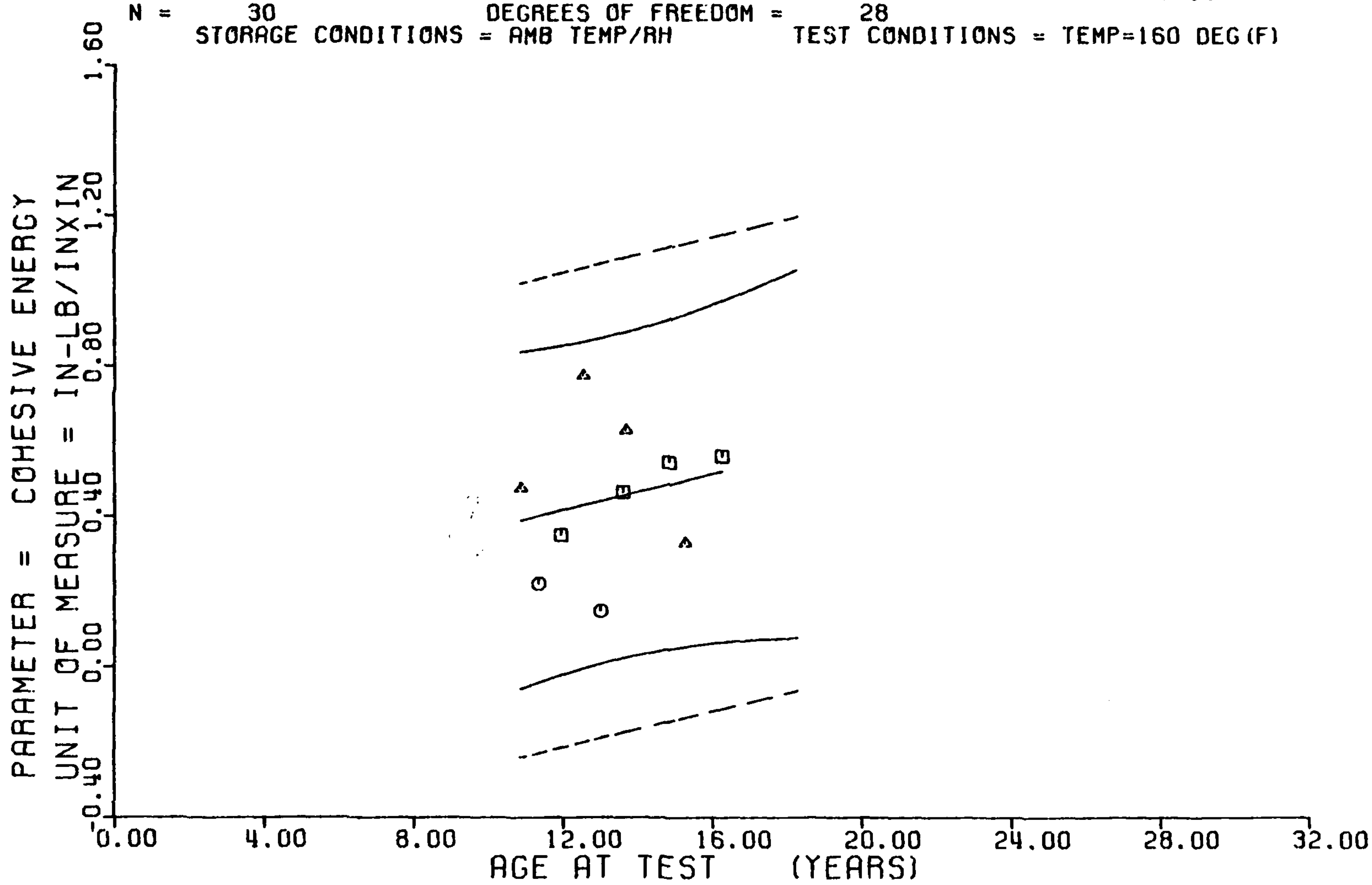
II STAGE DSCT MTRS, OUTER, TEAR ENERGY, X-HD/SPEED=0.01 IN/MIN, T/TEMP=120 DEG(F).

Figure 59

Y = ((+1.3139883E-01) + (+1.9812129E-03) * X)

F = +1.0622780E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y = +2.1036640E-01
R = +1.9118519E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT S_β = +1.9222597E-03
t = +1.0306687E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT S_ε = +2.1014088E-01
N = 30 DEGREES OF FREEDOM = 28

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = TEMP=160 DEG(F)



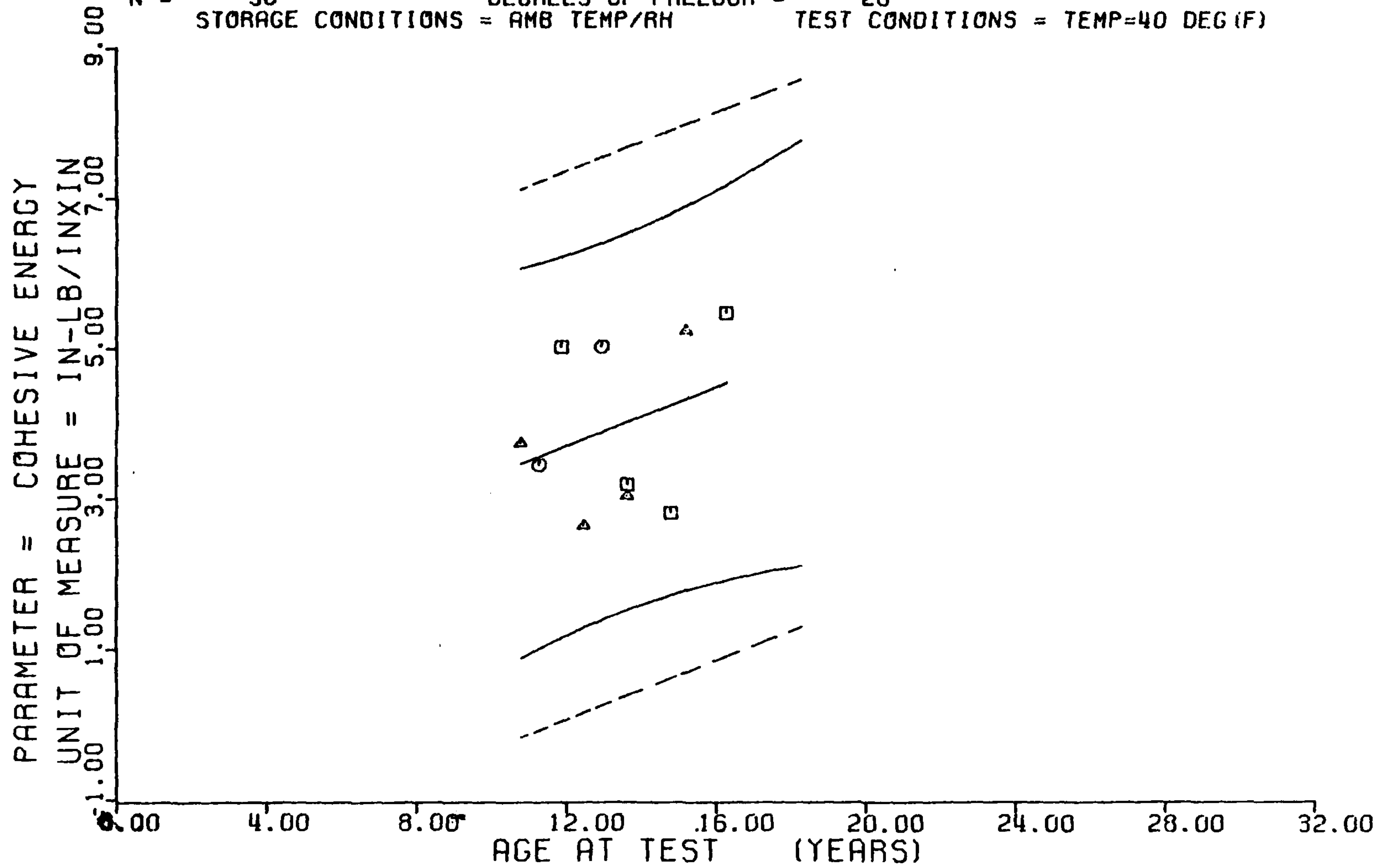
II STAGE DSCT MTRS, OUTER, TEAR ENERGY, X-HD/SPEED=0.01 IN/MIN, T/TEMP=160 DEG(F).

Figure 60

Y = ((+1.3783303E+00) + (+1.6277039E-02) * X)

F = +2.1870273E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y = +1.2396242E+00
R = +2.6916397E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT S_B = +1.1006476E-02
t = +1.4788601E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT S_E = +1.2150073E+00
N = 30 DEGREES OF FREEDOM = 28

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = TEMP=40 DEG (F)



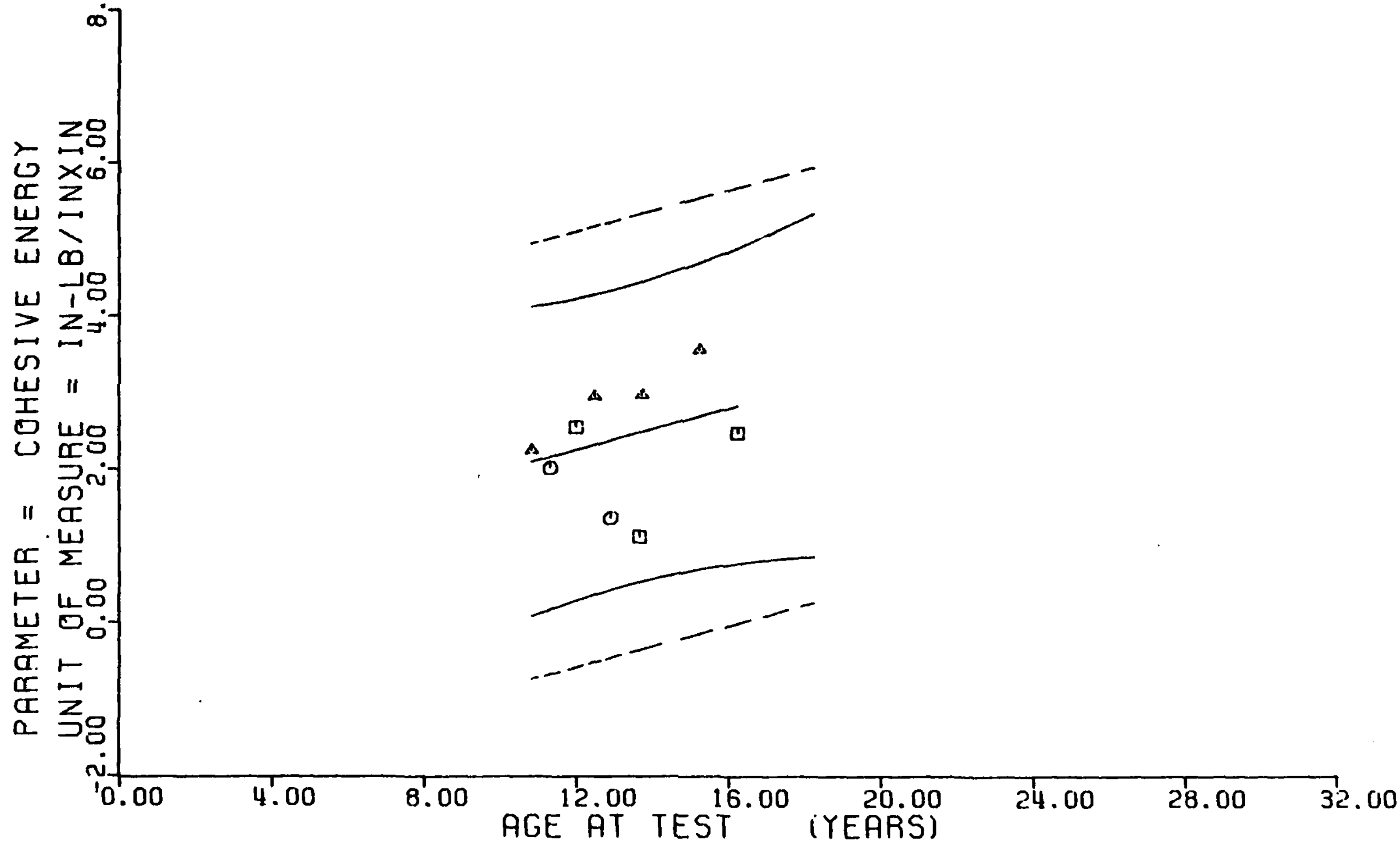
II STAGE DSCT MTRS, INNER, TEAR ENERGY, X-HD/SPEED=1.0 IN/MIN, T/TEMP=40 DEG (F).

Figure 61

Y = ((+6.6042894E-01) + (+1.1146572E-02) * X)

F = +1.5183693E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y = +9.5632810E-01
R = +2.2679972E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT S_B = +9.0459176E-03
t = +1.2322213E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT S_E = +9.4789391E-01
N = 30 DEGREES OF FREEDOM = 28

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = TEMP=77 DEG(F)



II STAGE DSCT MTRS, INNER, TEAR ENERGY, X-HD/SPEED=1.0 IN/MIN, T/TEMP=77 DEG(F).

Figure 62

Y = ((-7.9746267E-01) + (+1.4733801E-02) * X)

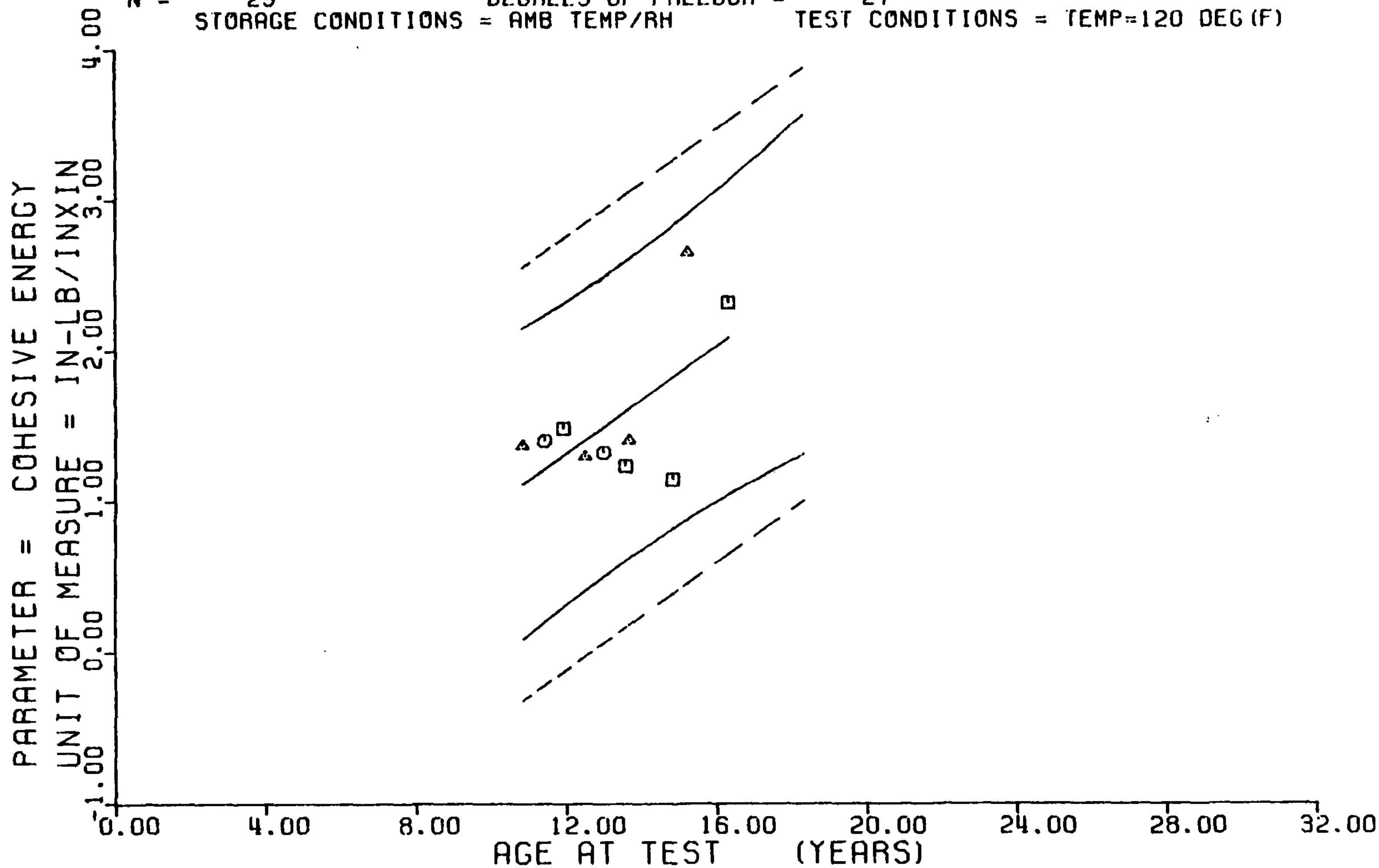
F = +1.0887294E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +5.5645780E-01

R = +5.3605974E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +4.4653430E-03

ι = +3.2995901E+00 SIGNIFICANCE OF ι = SIGNIFICANT S_E = +4.7837056E-01

N = 29 DEGREES OF FREEDOM = 27

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = TEMP=120 DEG (F)



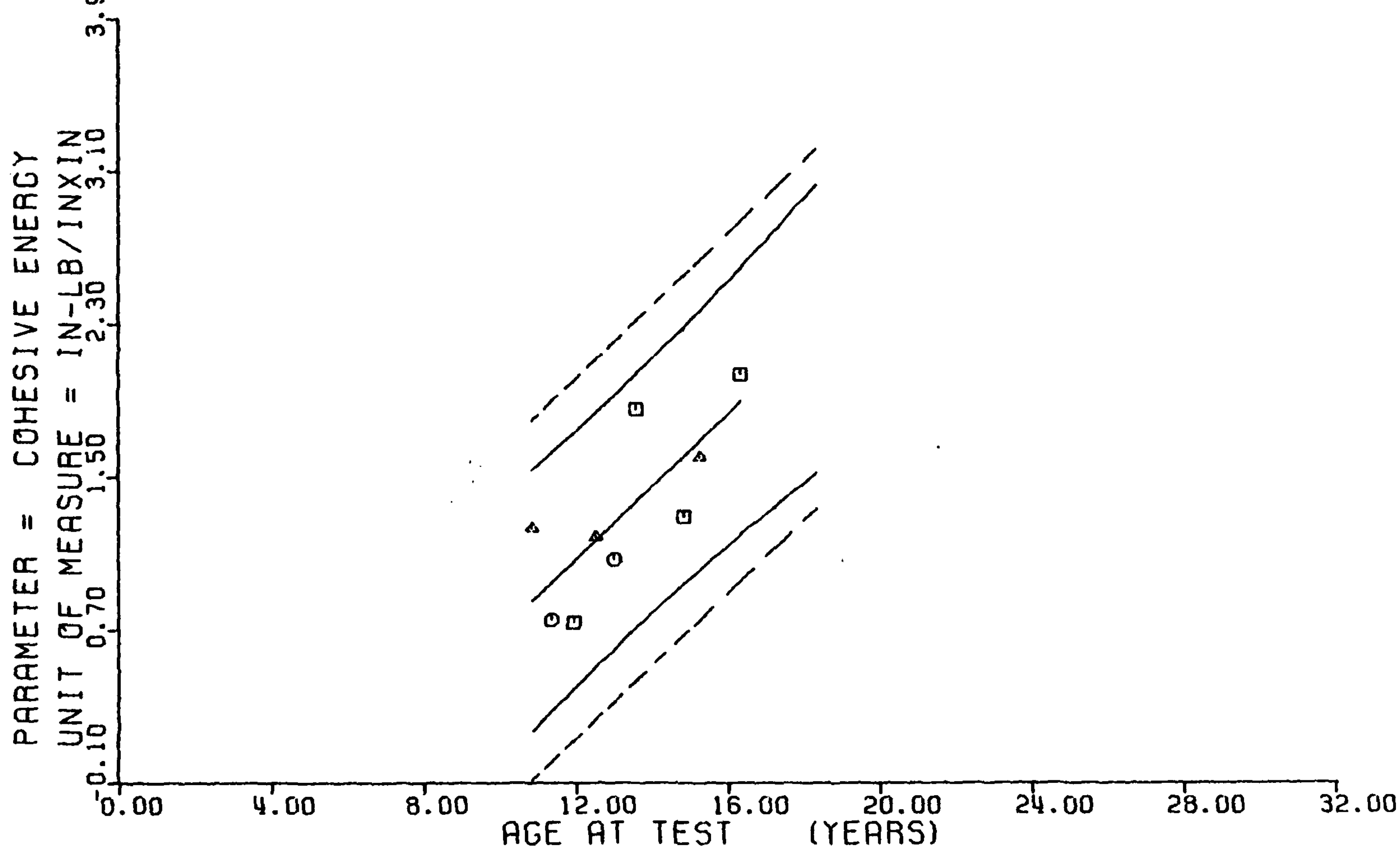
II STAGE DSCT MTRS, INNER, TEAR ENERGY, X-HD/SPEED=1.0 IN/MIN, T/TEMP=120 DEG (F).

Figure 63

$$Y = ((-1.2056607E+00) + (+1.5811238E-02) * X)$$

F = +2.9888057E+01	SIGNIFICANCE OF F = SIGNIFICANT	σ_Y = +4.6029138E-01
R = +7.4473639E-01	SIGNIFICANCE OF R = SIGNIFICANT	S_B = +2.8921248E-03
t = +5.4669970E+00	SIGNIFICANCE OF t = SIGNIFICANT	S_E = +3.1351374E-01
N = 26	DEGREES OF FREEDOM = 24	

STORAGE CONDITIONS = AMB TEMP/RH   TEST CONDITIONS = TEMP=160 DEG (F)



II STAGE DSCT MTRS, INNER, TEAR ENERGY, X-HD/SPEED=1.0 IN/MIN, T/TEMP=160 DEG (F).

Figure 64

Y = ((+1.8859956E+00) + (-9.1829850E-04) * X)

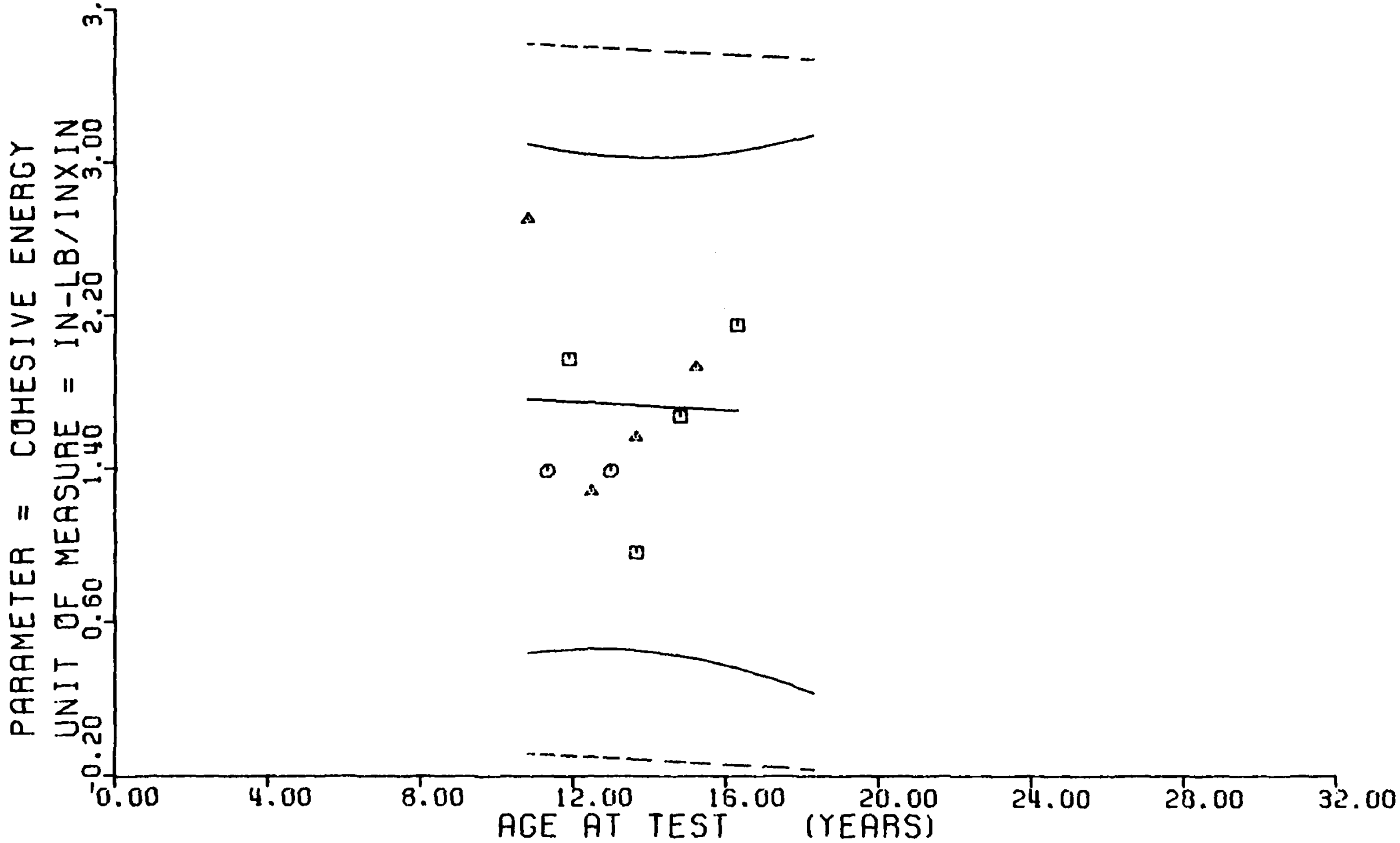
F = +2.6804151E-02 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y = +6.0711505E-01

R = -3.2091543E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT S_B = +5.6089664E-03

ι = +1.6371973E-01 SIGNIFICANCE OF ι = NOT SIGNIFICANT S_ε = +6.1836152E-01

N = 28 DEGREES OF FREEDOM = 26

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = TEMP=40 DEG(F)



II STAGE DSCT MTRS, INNER, TEAR ENERGY, X-HD/SPEED=0.01 IN/MIN, T/TEMP=40 DEG(F).

Figure 65

Y = ((-4.8670763E-01) + (+9.8057821E-03) * X)

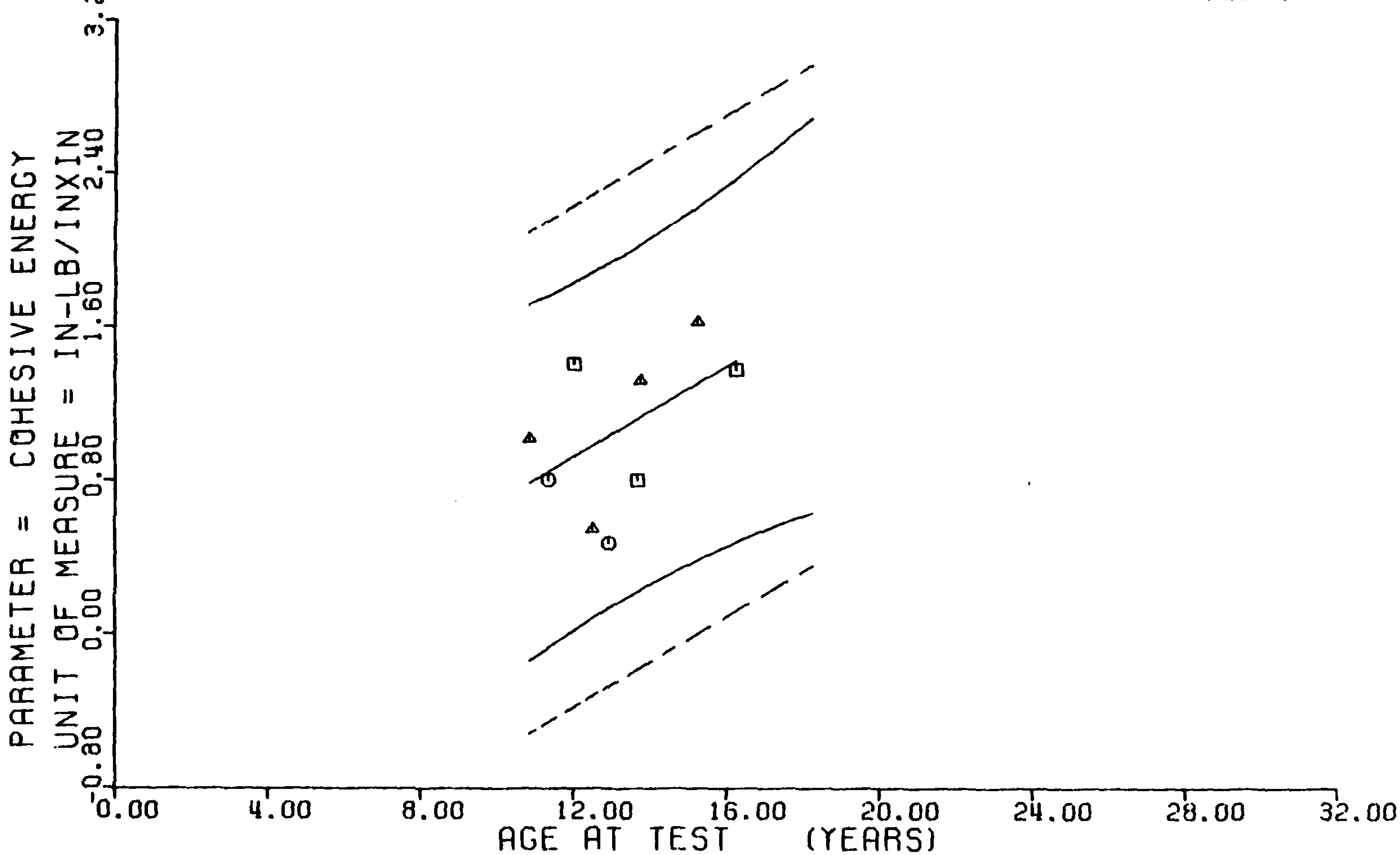
F = +5.5738782E+00 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +4.6828727E-01

R = +4.0745343E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +4.1533975E-03

t = +2.3609062E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +4.3522176E-01

N = 30 DEGREES OF FREEDOM = 28

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = TEMP=77 DEG (F)



II STAGE DSCT MTRS, INNER, TEAR ENERGY, X-HD/SPEED=0.01 IN/MIN, T/TEMP=77 DEG (F).

Figure 66

Y = ((-4.3483884E-01) + (+6.8020917E-03) * X)

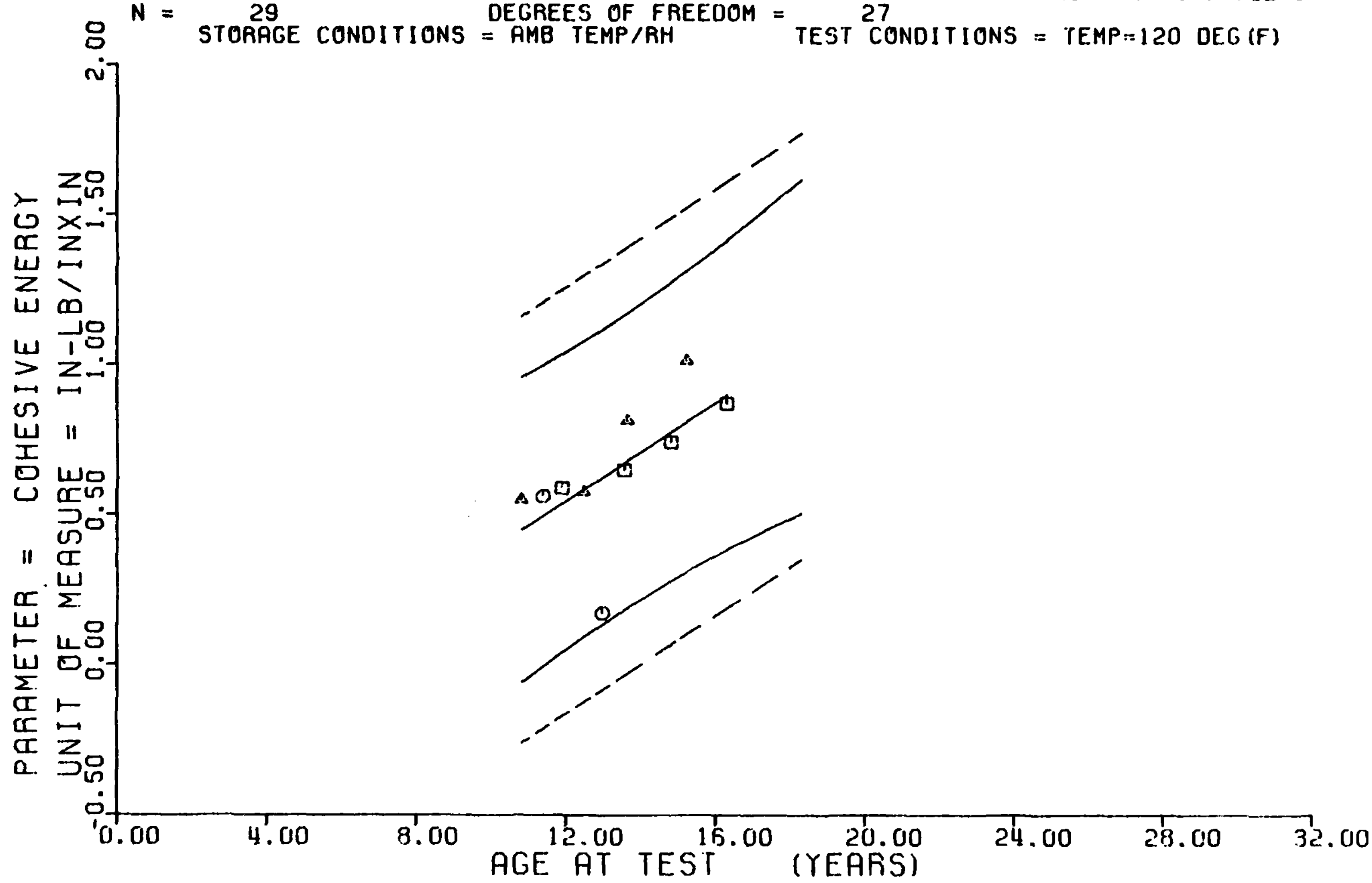
F = +9.8361539E+00 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +2.7160397E-01

R = +5.1674409E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +2.1688515E-03

t = +3.1362643E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +2.3679798E-01

N = 29 DEGREES OF FREEDOM = 27

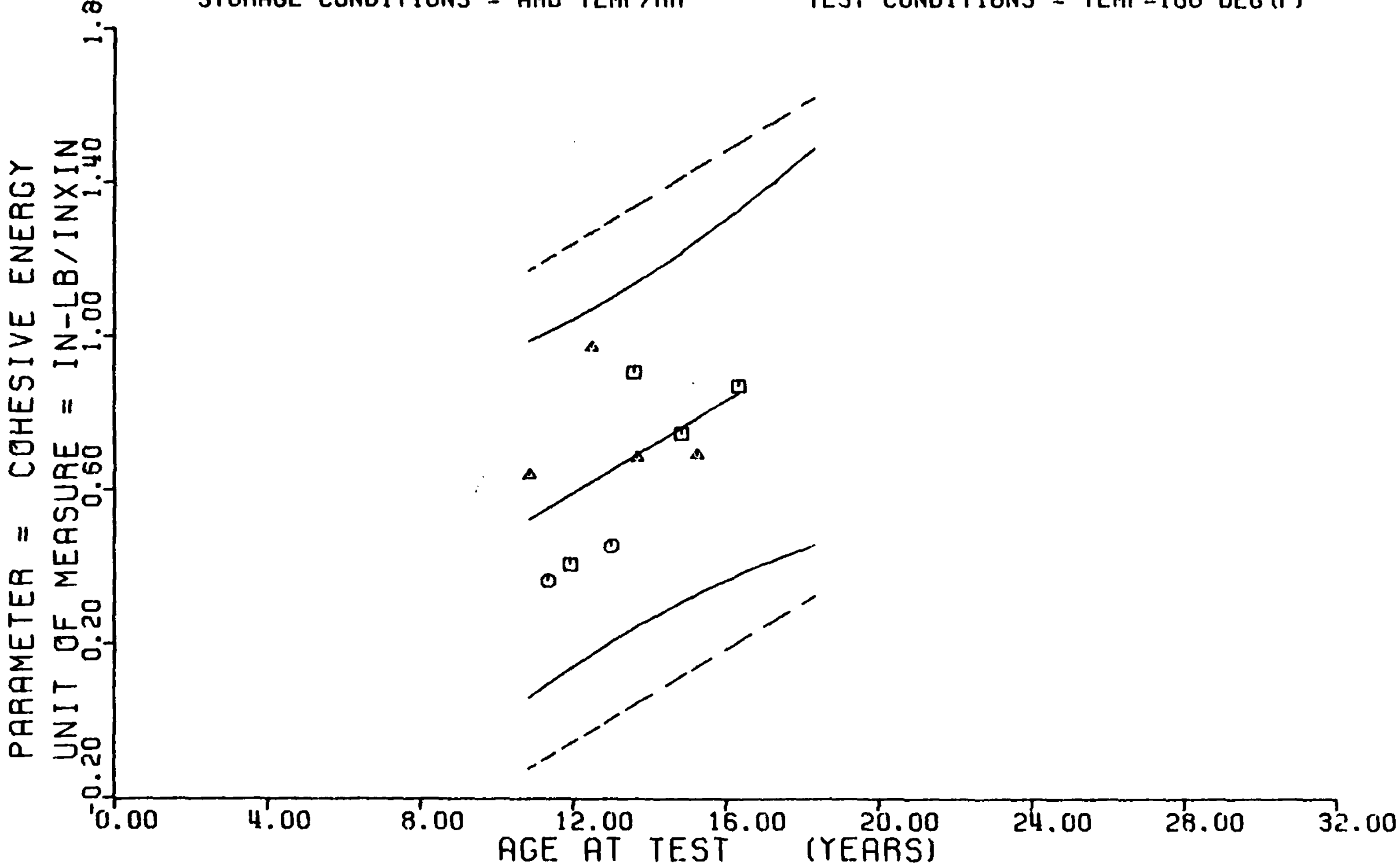
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = TEMP=120 DEG(F)



II STAGE DSCT MTRS, INNER, TEAR ENERGY. X-HD/SPEED=0.01 IN/MIN, T/TEMP=120 DEG(F).

Figure 67

Y = ((-1.2398764E-01) + (+4.9907284E-03) * X)
F = +5.7801121E+00 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +2.3359655E-01
R = +4.1991647E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +2.0758492E-03
t = +2.4041863E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +2.1589382E-01
N = 29 DEGREES OF FREEDOM = 27
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = TEMP=160 DEG(F)



II STAGE DSCT MTRS, INNER, TEAR ENERGY, X-HD/SPEED=0.01 IN/MIN, T/TEMP=160 DEG(F).

Figure 68

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
99.0	8	+2.4124979E-01	+7.3303108E-03	+2.5000000E-01	+2.2599995E-01	+2.5793021E-01
101.0	8	+2.4637472E-01	+5.1938044E-03	+2.5099998E-01	+2.3699998E-01	+2.5936359E-01
112.0	8	+2.5474977E-01	+6.5268895E-03	+2.6599997E-01	+2.4599999E-01	+2.6724684E-01
116.0	6	+2.8466653E-01	+1.2912239E-02	+3.0499994E-01	+2.7099996E-01	+2.7011352E-01
122.0	6	+2.6649963E-01	+2.3808063E-03	+2.6899999E-01	+2.6299995E-01	+2.7441346E-01
129.0	6	+2.8199988E-01	+7.9519349E-03	+2.9699999E-01	+2.7399998E-01	+2.7943015E-01
130.0	3	+3.2133328E-01	+8.3845155E-03	+3.3099997E-01	+3.1599998E-01	+2.8014677E-01
136.0	3	+3.2399994E-01	+1.8357310E-02	+3.4499996E-01	+3.1099998E-01	+2.8444677E-01
143.0	3	+3.5733318E-01	+7.5123672E-03	+3.6499994E-01	+3.4999996E-01	+2.8946340E-01
164.0	3	+3.3666640E-01	+2.1319166E-03	+3.3899998E-01	+3.3499997E-01	+3.0451333E-01
177.0	3	+3.1299996E-01	+3.2969061E-02	+3.3399999E-01	+2.7499997E-01	+3.1382995E-01
183.0	3	+2.5666660E-01	+9.60[illegible]844E-03	+2.6699995E-01	+2.4799996E-01	+3.1812989E-01
196.0	3	+3.0299997E-01	+5.2887397E-03	+3.0899995E-01	+2.9899996E-01	+3.2744652E-01

STAGE II DISSECTED MTRS.OUTER.BURNING RATE AT 500 PSI

This sample size summary is applicable to figure 69

Y = ((+1.8698066E-01) + (+7.1666271E-04) * X)

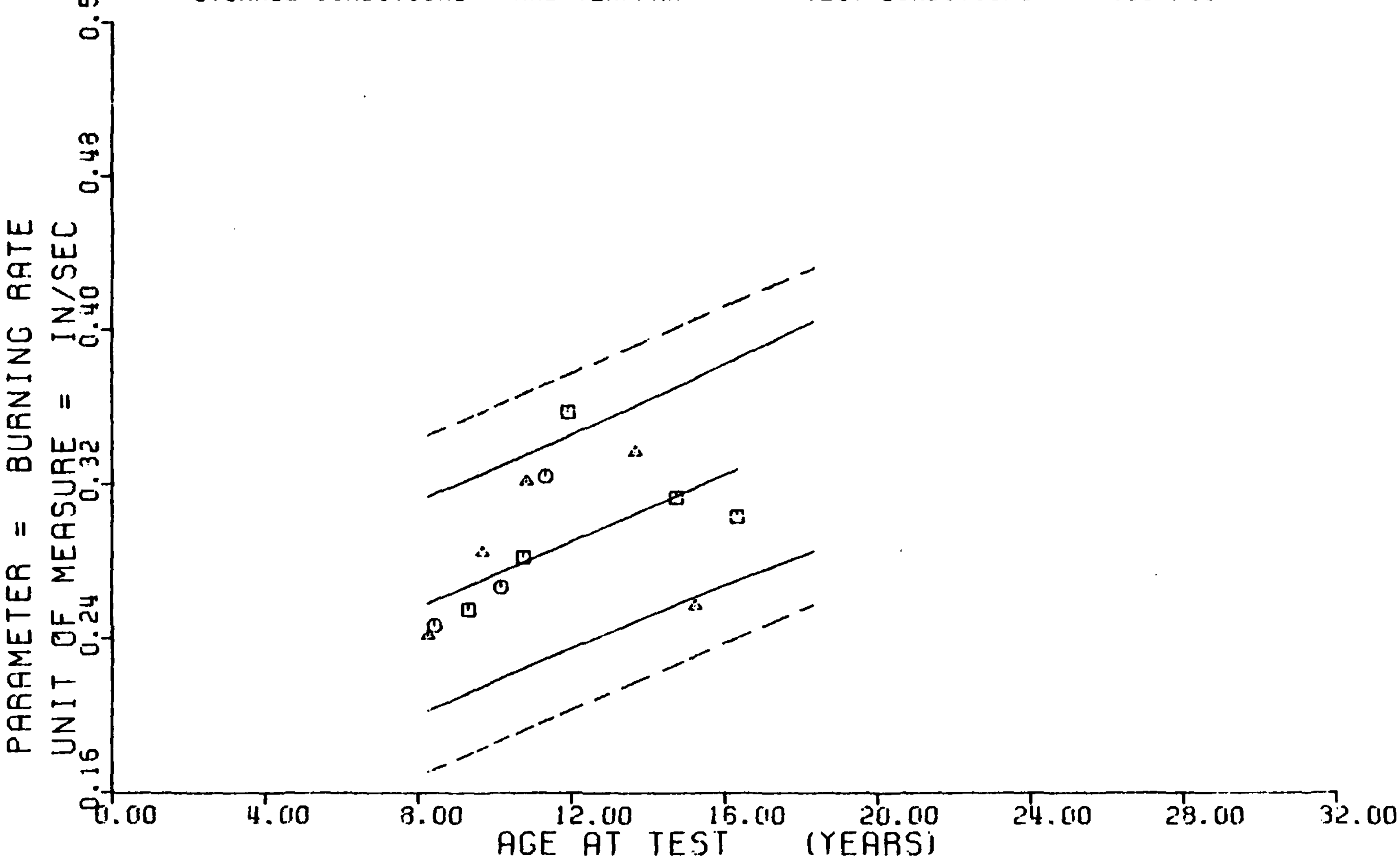
F = +3.0647760E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +3.5405680E-02

R = +5.7828036E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +1.2945398E-04

t = +5.5360419E+00 SIGNIFICANCE OF t = SIGNIFICANT S_t = +2.9121105E-02

N = 63 DEGREES OF FREEDOM = 61

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 500 PSI



STAGE II DISSECTED MTRS,OUTER,BURNING RATE AT 500 PSI

Figure 69

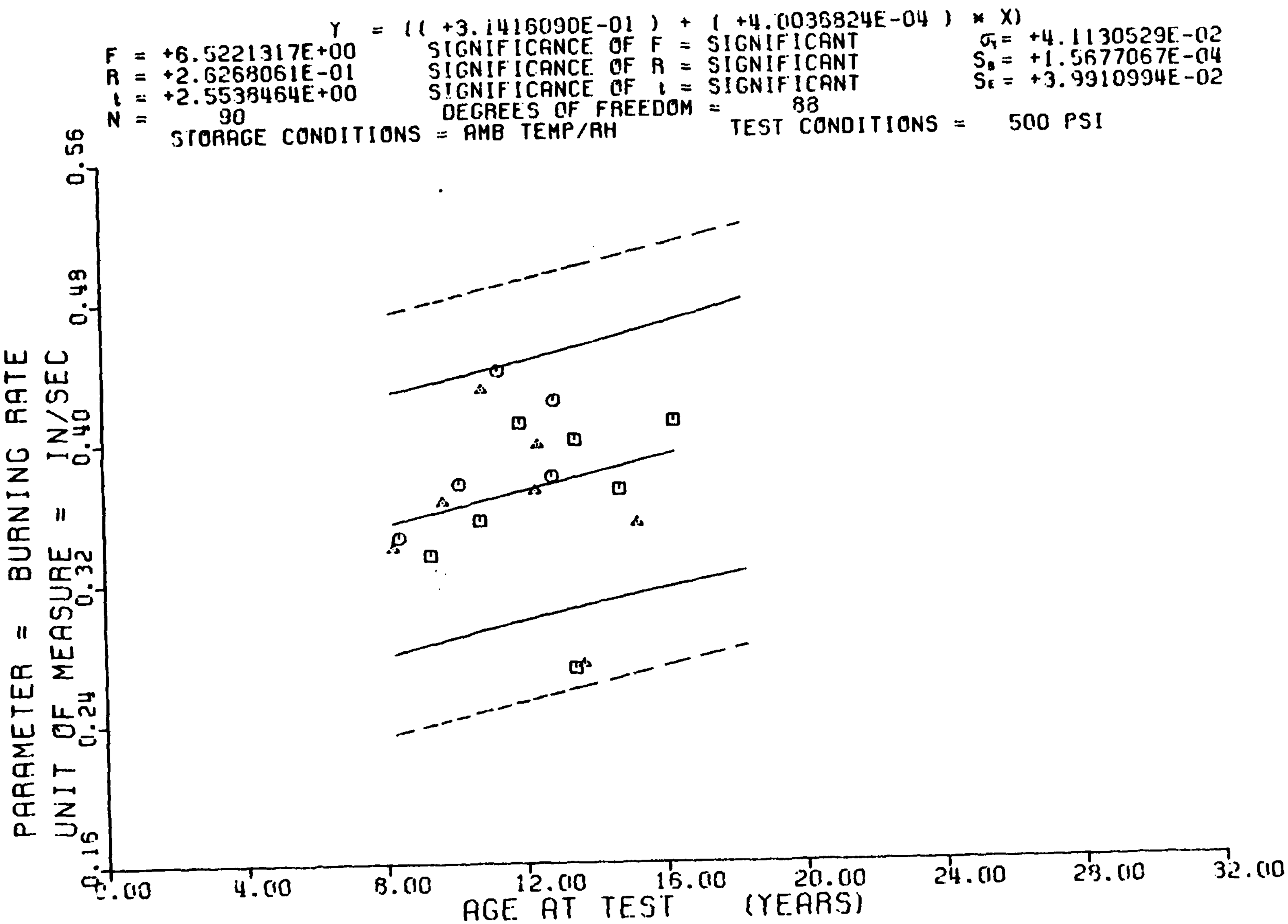
**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
99.0	8	+3.3949971E-01	+8.7289668E-03	+3.4999996E-01	+3.2299995E-01	+3.5379731E-01
101.0	8	+3.4537458E-01	+7.7998263E-03	+3.5499995E-01	+3.3099997E-01	+3.5459804E-01
112.0	8	+3.3537447E-01	+5.4830428E-03	+3.4299999E-01	+3.2699996E-01	+3.5900211E-01
116.0	6	+3.6566621E-01	+1.1091773E-02	+3.8299995E-01	+3.5299998E-01	+3.6060357E-01
122.0	6	+3.7566626E-01	+2.6392265E-03	+3.7899994E-01	+3.7199997E-01	+3.6300581E-01
129.0	6	+3.5466635E-01	+1.0976121E-02	+3.6899995E-01	+3.3899998E-01	+3.6580836E-01
130.0	3	+4.2899990E-01	+1.0423056E-03	+4.2999994E-01	+4.2799997E-01	+3.6620873E-01
136.0	3	+4.3999987E-01	+8.8926405E-03	+4.4699996E-01	+4.2999994E-01	+3.6861097E-01
143.0	3	+4.0999984E-01	+1.5625256E-02	+4.1999995E-01	+3.9199995E-01	+3.7141352E-01
148.0	3	+3.7133312E-01	+7.5826026E-03	+3.7999999E-01	+3.6599999E-01	+3.7341535E-01
149.0	6	+3.9766645E-01	+8.2492111E-03	+4.0899997E-01	+3.8599997E-01	+3.7381577E-01
154.0	3	+3.7966662E-01	+3.5078943E-03	+3.8299995E-01	+3.7599998E-01	+3.7581759E-01
155.0	6	+4.2283308E-01	+5.1693175E-03	+4.2999994E-01	+4.1399997E-01	+3.7621796E-01
161.0	3	+2.7066659E-01	+1.1371360E-02	+2.7999997E-01	+2.5799995E-01	+3.7862014E-01
162.0	6	+4.0016633E-01	+1.0393267E-02	+4.0899997E-01	+3.8199996E-01	+3.7902051E-01
164.0	3	+2.7299994E-01	+1.8846263E-04	+2.7299994E-01	+2.7299994E-01	+3.7982124E-01
177.0	3	+3.7199974E-01	+2.8359188E-02	+3.9399999E-01	+3.3999997E-01	+3.8502603E-01
183.0	3	+3.5233306E-01	+1.2581447E-03	+3.5299998E-01	+3.5099995E-01	+3.8742828E-01
196.0	3	+4.1033297E-01	+1.3027742E-02	+4.2299997E-01	+3.9699995E-01	+3.9263308E-01

STAGE II DISSECTED MTRS.INNER.BURNING RATE AT 500 PSI

This sample size summary is applicable to figure 70



STAGE II DISSECTED MTRS, INNER, BURNING RATE AT 500 PSI

Figure 70

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
99.0	36	+6.7694442E+01	+1.4893803E+00	+7.0000000E+01	+6.5000000E+01	+6.7803115E+01
113.0	18	+7.1833328E+01	+9.2354814E-01	+7.3000000E+01	+7.0000000E+01	+6.7453857E+01
115.0	16	+6.6812500E+01	+1.1672617E+00	+6.9000000E+01	+6.5000000E+01	+6.7403976E+01
121.0	16	+6.3875000E+01	+1.3601470E+00	+6.6000000E+01	+6.1000000E+01	+6.7254287E+01
128.0	16	+6.8187500E+01	+2.0726392E+00	+7.1000000E+01	+6.5000000E+01	+6.7079666E+01
130.0	8	+6.6750000E+01	+1.0350983E+00	+6.8000000E+01	+6.5000000E+01	+6.7029785E+01
136.0	8	+6.5125000E+01	+6.4086994E-01	+6.6000000E+01	+6.4000000E+01	+6.6880096E+01
143.0	8	+6.5875000E+01	+1.9594095E+00	+6.8000000E+01	+6.3000000E+01	+6.6705474E+01
147.0	8	+6.5250000E+01	+1.1649647E+00	+6.7000000E+01	+6.4000000E+01	+6.6605697E+01
161.0	16	+6.6250000E+01	+1.2909944E+00	+6.8000000E+01	+6.4000000E+01	+6.6256439E+01
164.0	8	+6.4500000E+01	+1.5118578E+00	+6.7000000E+01	+6.3000000E+01	+6.6181610E+01
177.0	8	+6.7625000E+01	+1.1877349E+00	+7.0000000E+01	+6.6000000E+01	+6.5857315E+01
183.0	8	+6.0375000E+01	+1.9226098E+00	+6.3000000E+01	+5.8000000E+01	+6.5707626E+01
195.0	8	+7.1250000E+01	+1.1649647E+00	+7.3000000E+01	+7.0000000E+01	+6.5408279E+01

II STAGE DSCT MTRS ONLY,OUTER,HARDNESS,NON-ORNTD,MSN=0022135,0022583,0022788

This sample size summary is applicable to figure 71

Y = ((+7.0272790E+01) + (-2.4946189E-02) * X)

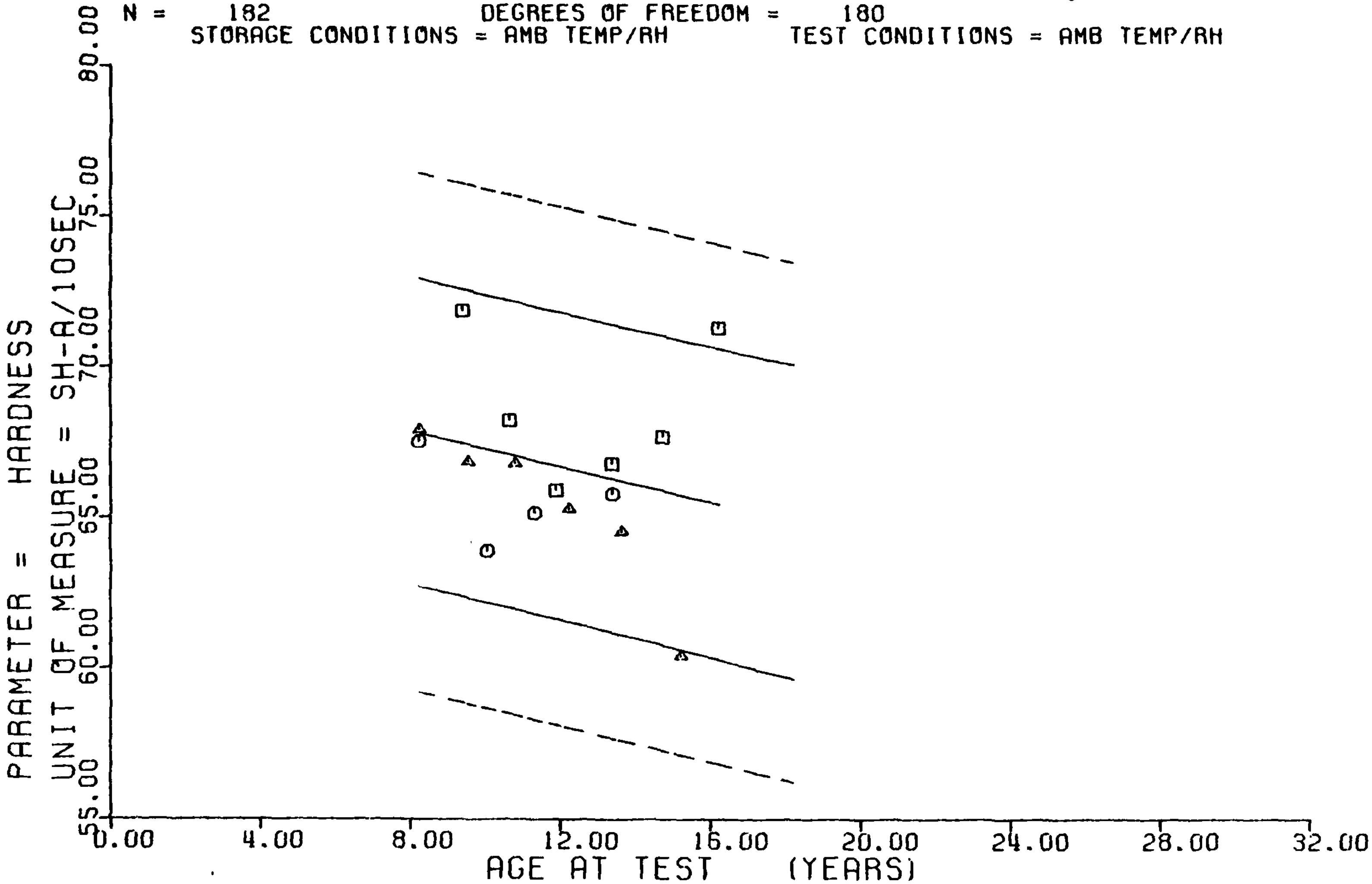
F = +1.0989591E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +2.9504642E+00

R = -2.3987552E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +7.5251200E-03

t = +3.3150553E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +2.8722669E+00

N = 182 DEGREES OF FREEDOM = 180

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTRS ONLY, OUTER, HARDNESS, NON-ORNTD, MSN=0022135, 0022583, 0022788

Figure 71

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
99.0	36	+6.2055541E+01	+1.3720567E+00	+6.6000000E+01	+6.0000000E+01	+6.2284591E+01
113.0	18	+7.2666656E+01	+7.6696498E-01	+7.4000000E+01	+7.2000000E+01	+6.2765289E+01
115.0	16	+5.6687500E+01	+1.0144785E+00	+5.8000000E+01	+5.5000000E+01	+6.2833953E+01
121.0	16	+5.5437500E+01	+3.1191612E+00	+5.9000000E+01	+5.1000000E+01	+6.3039962E+01
128.0	16	+6.6687500E+01	+8.7321245E-01	+6.8000000E+01	+6.5000000E+01	+6.3280319E+01
130.0	8	+6.2125000E+01	+1.2464234E+00	+6.5000000E+01	+6.1000000E+01	+6.3348983E+01
136.0	8	+6.3000000E+01	+7.5592894E-01	+6.4000000E+01	+6.2000000E+01	+6.3554992E+01
143.0	8	+6.7625000E+01	+7.4402380E-01	+6.9000000E+01	+6.7000000E+01	+6.3795349E+01
147.0	8	+6.1875000E+01	+6.4086994E-01	+6.3000000E+01	+6.1000000E+01	+6.3932678E+01
155.0	16	+6.3312500E+01	+2.7499999E+00	+6.8000000E+01	+6.0000000E+01	+6.4207366E+01
161.0	8	+6.9000000E+01	+5.3452248E-01	+7.0000000E+01	+6.8000000E+01	+6.4413375E+01
164.0	8	+5.9125000E+01	+1.1259916E+00	+6.0000000E+01	+5.7000000E+01	+6.4516387E+01
177.0	8	+6.8625000E+01	+9.1612538E-01	+7.0000000E+01	+6.7000000E+01	+6.4962738E+01
183.0	8	+6.1250000E+01	+1.9820624E+00	+6.4000000E+01	+5.9000000E+01	+6.5168746E+01
195.0	8	+6.7875000E+01	+6.4086994E-01	+6.9000000E+01	+6.7000000E+01	+6.5580764E+01

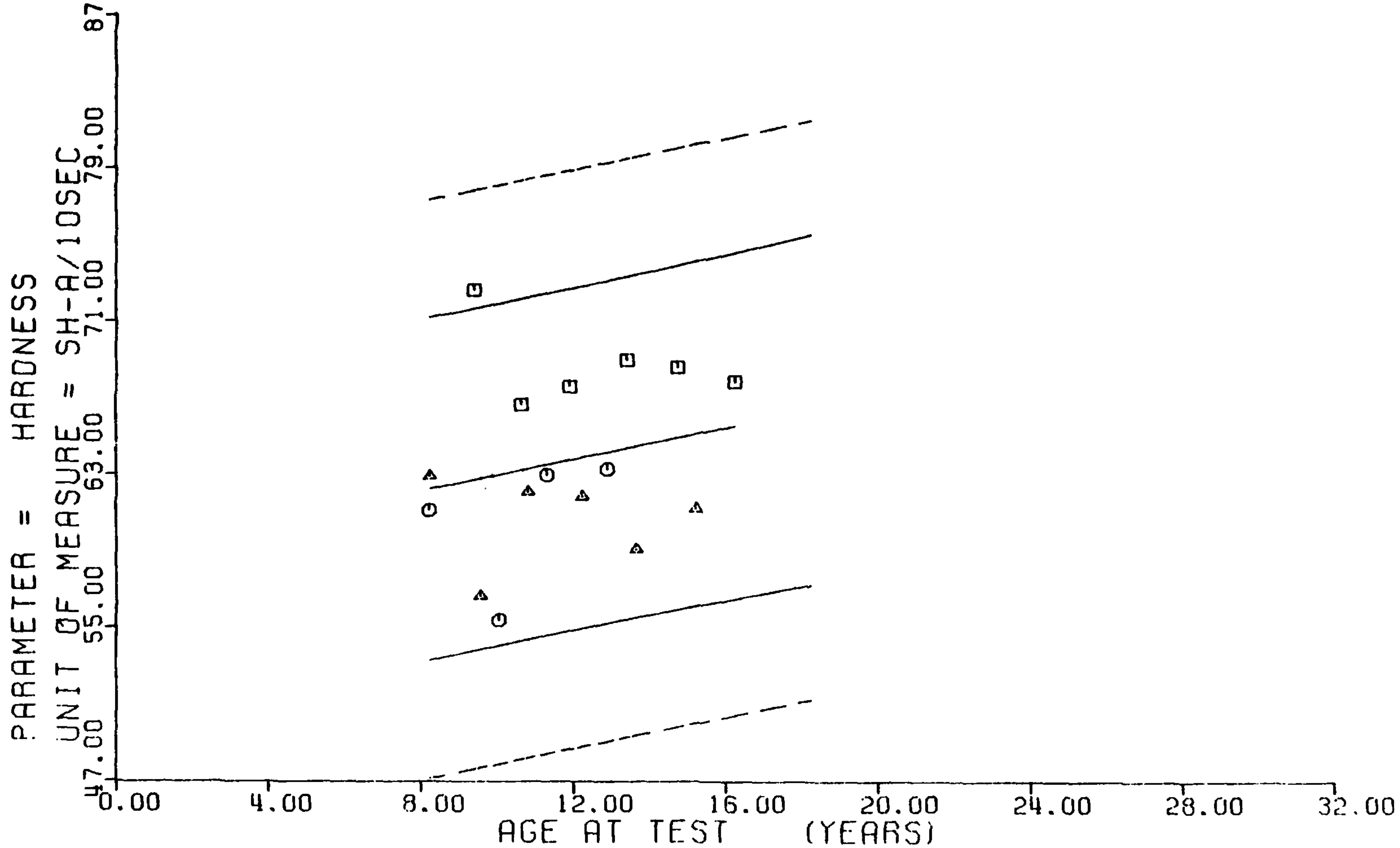
II STAGE DSCT MTRS ONLY,INNER,HARDNESS,NON-ORNTD,MSN=0022135,0022583,0022788

This sample size summary is applicable to figure 72

Y = ((+5.8885424E+01) + (+3.4335146E-02) * X)

F = +6.8427810E+00 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +5.1111292E+00
R = +1.8740197E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +1.3125703E-02
t = +2.6158709E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +5.0339118E+00
N = 190 DEGREES OF FREEDOM = 188

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTRS ONLY, INNER, HARDNESS, NON-ORNTD, MSN=0022135,0022583,0022788

Figure 72

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
100.0	8	+6.0699938E-05	+3.6064478E-06	+6.4899999E-05	+5.5299999E-05	+5.8875928E-05
107.0	8	+6.1862403E-05	+2.0799505E-06	+6.5499989E-05	+5.8999998E-05	+5.9126861E-05
113.0	8	+5.8524950E-05	+2.8026965E-06	+6.2699997E-05	+5.5399999E-05	+5.9341953E-05
116.0	3	+5.9333324E-05	+1.8579846E-06	+6.0599995E-05	+5.7199998E-05	+5.9449506E-05
122.0	3	+6.4299980E-05	+2.3514228E-06	+6.6999986E-05	+6.2699997E-05	+5.9664598E-05
129.0	3	+5.9899990E-05	+4.8508042E-06	+6.5499989E-05	+5.6999997E-05	+5.9915531E-05
131.0	3	+5.3033320E-05	+5.9910167E-06	+5.9699988E-05	+4.8099987E-05	+5.9987229E-05
137.0	3	+5.3166659E-05	+3.5014814E-06	+5.6599994E-05	+4.9599999E-05	+6.0202321E-05
144.0	3	+5.6999982E-05	+5.3328859E-06	+6.1199985E-05	+5.0999995E-05	+6.0453268E-05
148.0	3	+5.7533325E-05	+4.7088606E-06	+6.2399994E-05	+5.2999996E-05	+6.0596663E-05
154.0	3	+5.9466648E-05	+1.8230929E-06	+6.1099999E-05	+5.7499986E-05	+6.0811755E-05
161.0	3	+5.8366655E-05	+2.3113455E-06	+6.0799997E-05	+5.6199991E-05	+6.1062688E-05
164.0	3	+6.1099985E-05	+2.9101019E-06	+6.3299987E-05	+5.7799989E-05	+6.1170241E-05
177.0	3	+6.6566659E-05	+3.0499544E-06	+6.9599991E-05	+6.3499988E-05	+6.1636281E-05
182.0	3	+6.0266655E-05	+7.0813469E-07	+6.0899998E-05	+5.9499987E-05	+6.1815517E-05
195.0	3	+6.9033325E-05	+2.2893684E-06	+7.1599992E-05	+6.7199987E-05	+6.2281556E-05

STAGE II DISSECTED MTRS.OUTER.THERMAL COEFFICIENT OF LINEAR EXPANSION BELOW TG

This sample size summary is applicable to figures 73 thru 76

Y = ((+6.6853822E-05) + (+1.8846082E-07) * X)

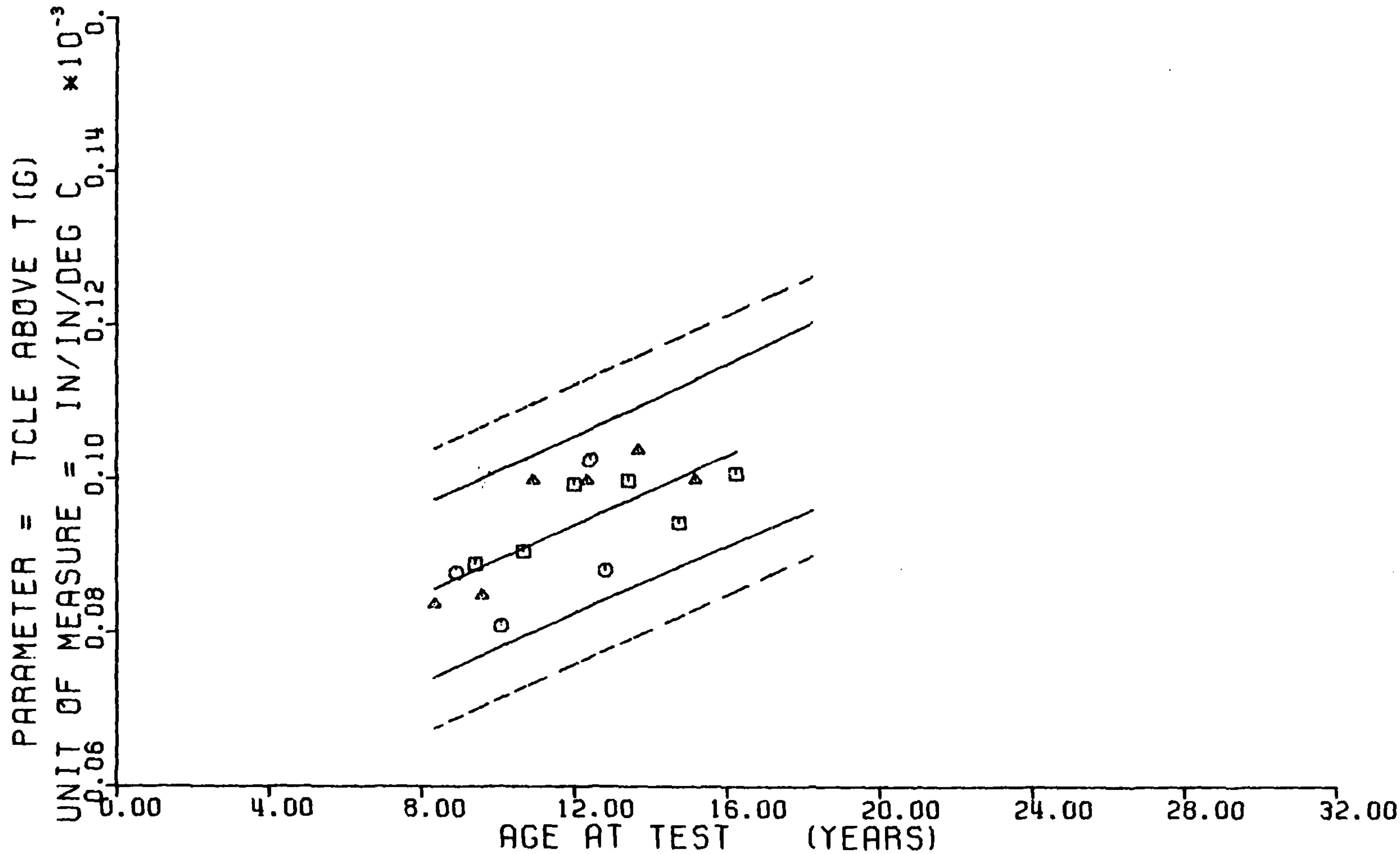
F = +5.1581010E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +8.1405764E-06

R = +6.7389472E-01 SIGNIFICANCE OF R = SIGNIFICANT S_a = +2.6240745E-08

t = +7.1819921E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +6.0627906E-06

N = 64 DEGREES OF FREEDOM = 62

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 5 DEGREES C/MIN



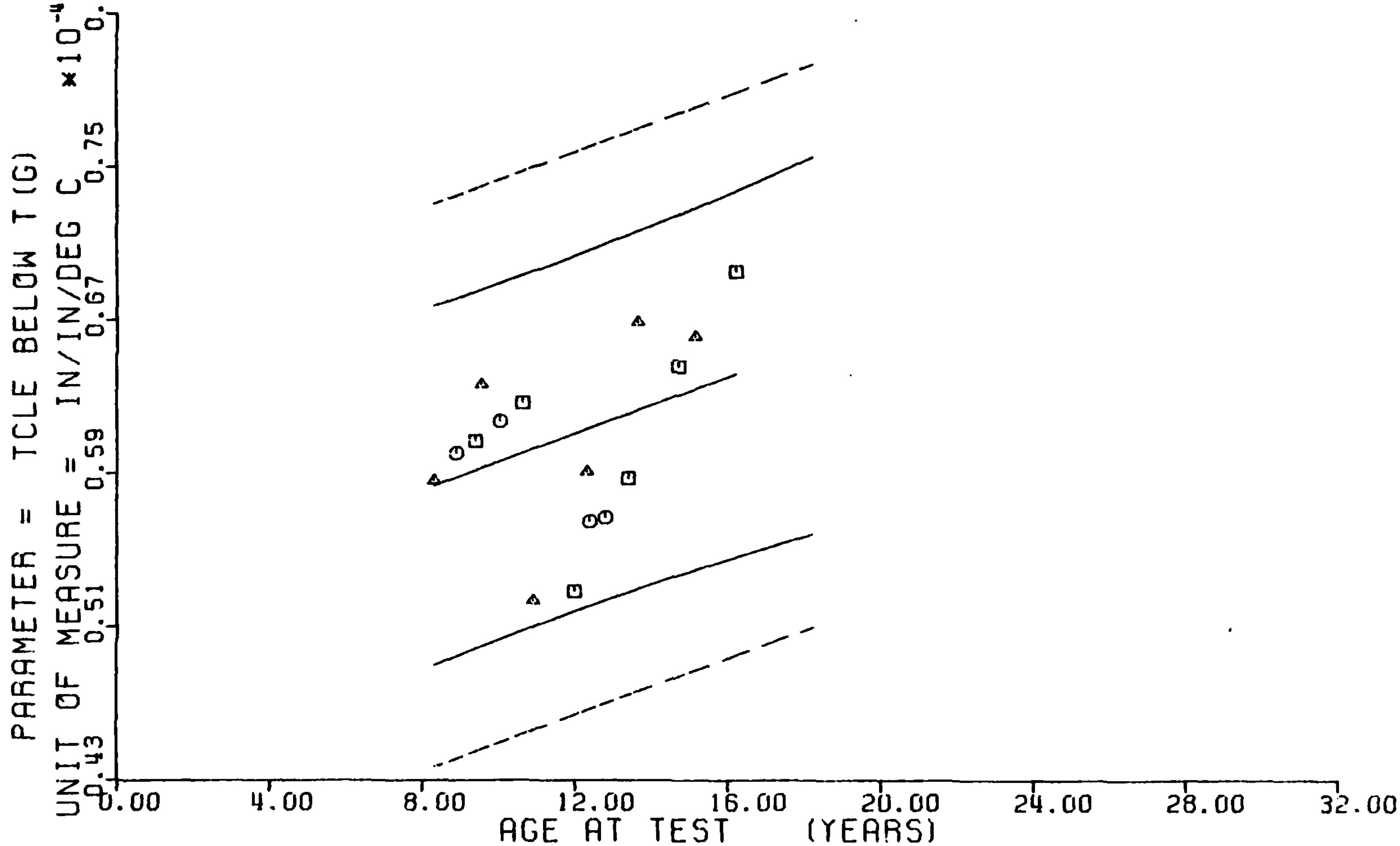
STAGE II DISSECTED MTRS, INNER, THERMAL COEFFICIENT OF LINEAR EXPANSION ABOVE TG

Figure 73

Y = ((+5.2268792E-05) + (+6.1244479E-08) * X)

F = +8.3442969E+00	SIGNIFICANCE OF F = SIGNIFICANT	σ_Y = +5.1762190E-06
R = +3.4441370E-01	SIGNIFICANCE OF R = SIGNIFICANT	S_B = +2.1201767E-08
t = +2.8886496E+00	SIGNIFICANCE OF t = SIGNIFICANT	S_E = +4.8985605E-06
N = 64	DEGREES OF FREEDOM = 62	

STORAGE CONDITIONS = AMB TEMP/RH   TEST CONDITIONS = 5 DEGREES C/MIN



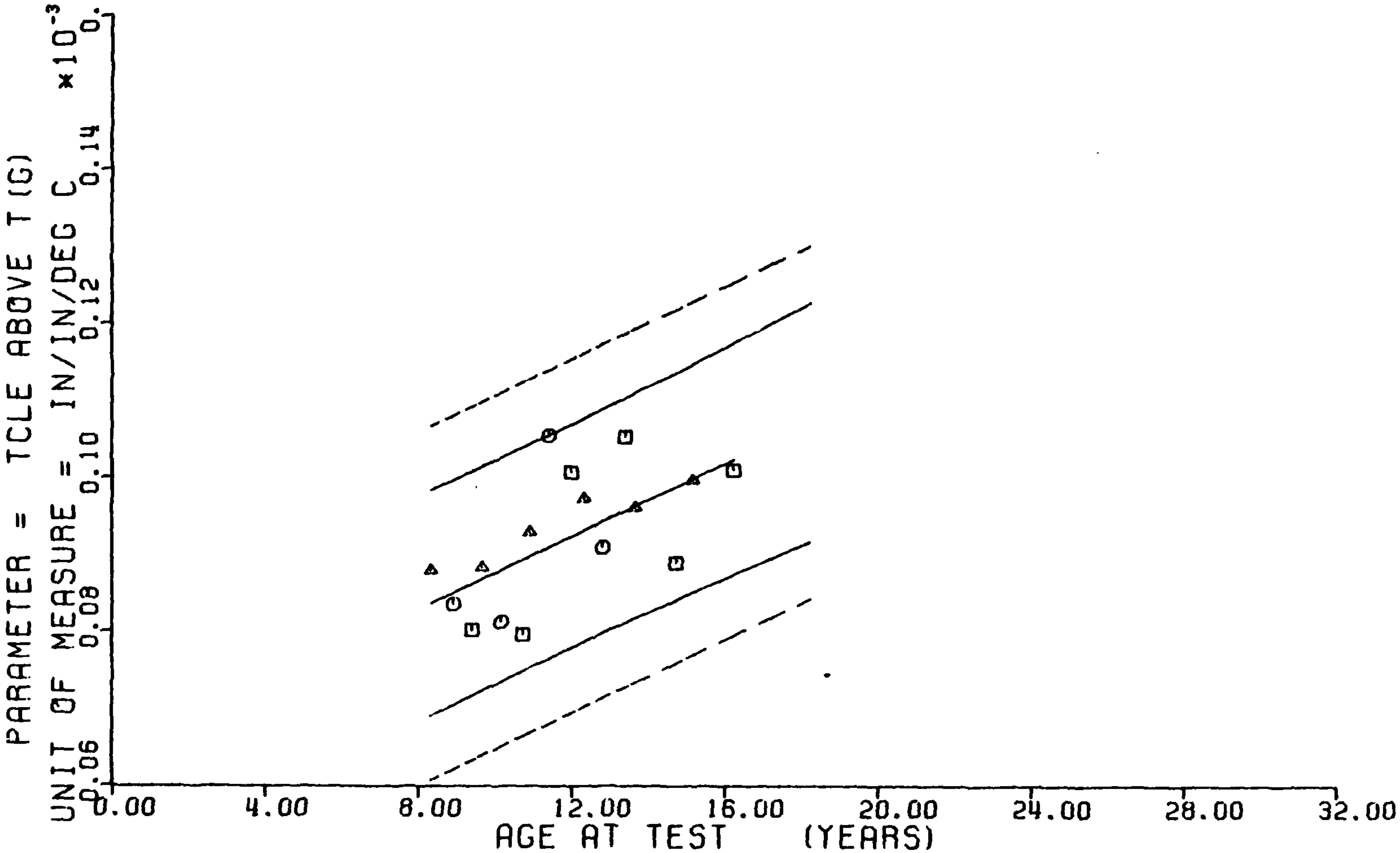
STAGE II DISSECTED MTRS, INNER, THERMAL COEFFICIENT OF LINEAR EXPANSION BELOW TG

Figure 76

Y = ((+6.3975237E-05) + (+1.9711611E-07) * X)

F = +3.3665737E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +9.4557294E-06
R = +5.9634510E-01 SIGNIFICANCE OF R = SIGNIFICANT S_b = +3.3972543E-08
t = +5.8022183E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +7.6523437E-06
N = 63 DEGREES OF FREEDOM = 61

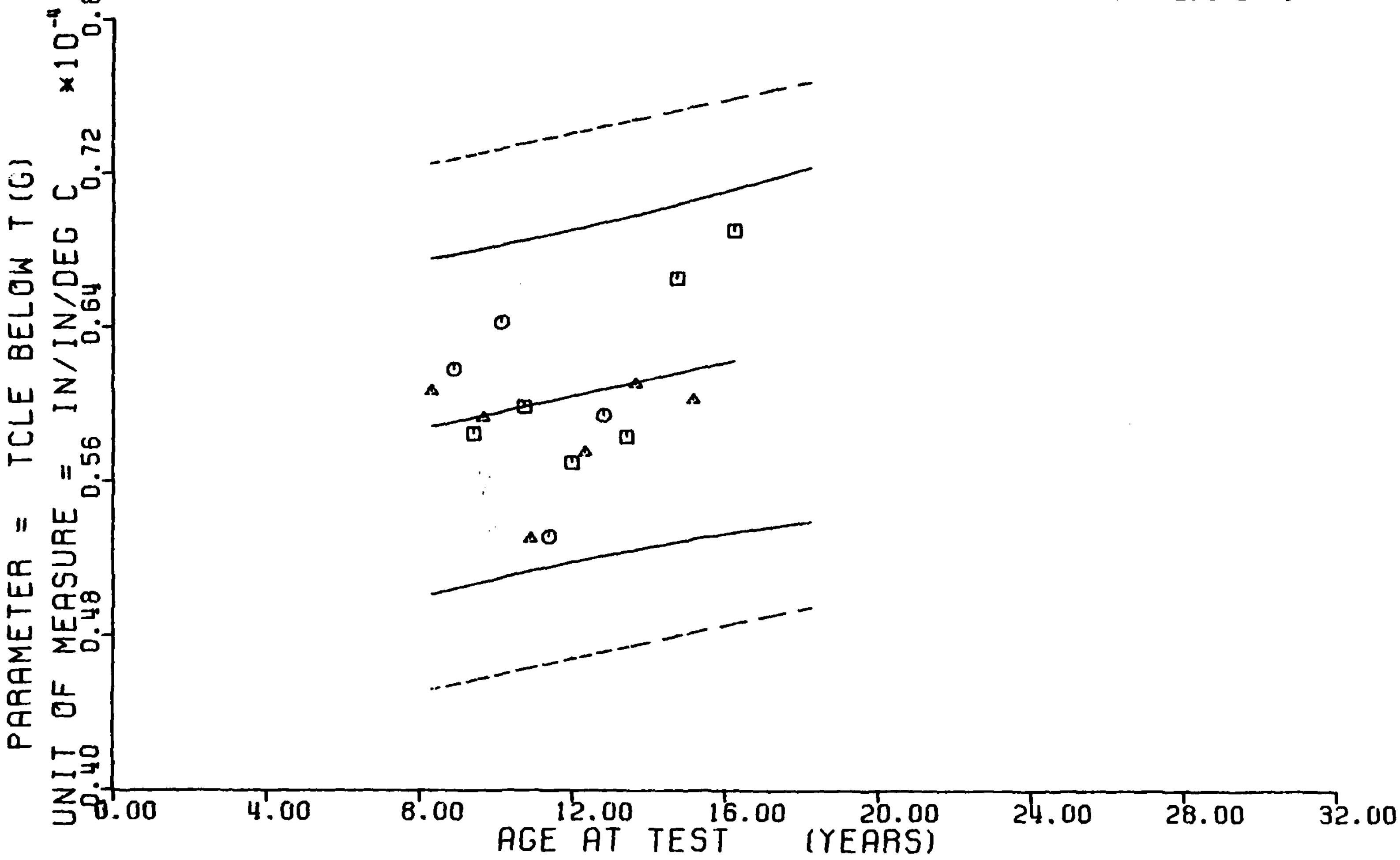
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 5 DEGREES C/MIN



STAGE II DISSECTED MTRS,OUTER,THERMAL COEFFICIENT OF LINEAR EXPANSION ABOVE TG

Figure 75

Y = ((+5.5291067E-05) + (+3.5848665E-08) * X)
F = +3.1540992E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y = +4.6250674E-06
R = +2.2173051E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT S_B = +2.0185304E-08
ι = +1.7759783E+00 SIGNIFICANCE OF ι = NOT SIGNIFICANT S_E = +4.5467566E-06
N = 63 DEGREES OF FREEDOM = 61
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 5 DEGREES C/MIN



STAGE II DISSECTED MTRS, OUTER, THERMAL COEFFICIENT OF LINEAR EXPANSION BELOW TG

Figure 76

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
100.0	6	+1.2024826E+01	+5.6651574E-01	+1.2693699E+01	+1.1384199E+01	+1.1909018E+01
114.0	5	+1.1555395E+01	+1.4691941E-01	+1.1795099E+01	+1.1423899E+01	+1.1794237E+01
116.0	6	+1.2756441E+01	+2.6294711E-01	+1.3028599E+01	+1.2320899E+01	+1.1777840E+01
122.0	6	+1.1422027E+01	+3.1548073E-01	+1.2033799E+01	+1.1168399E+01	+1.1728648E+01
129.0	6	+1.3652626E+01	+1.9493047E-01	+1.3922099E+01	+1.3395699E+01	+1.1671257E+01
148.0	3	+8.5090637E+00	+1.5948430E-01	+8.6605997E+00	+8.3429994E+00	+1.1515483E+01
154.0	2	+7.5400495E+00	+7.9109025E-02	+7.5959997E+00	+7.4840993E+00	+1.1466292E+01
161.0	3	+9.4458255E+00	+1.0423156E-01	+9.5470991E+00	+9.3402996E+00	+1.1408902E+01
164.0	4	+9.6453208E+00	+1.7543369E-01	+9.8585996E+00	+9.4409999E+00	+1.1384305E+01
177.0	4	+1.1264122E+01	+3.3859715E-01	+1.1665199E+01	+1.0946399E+01	+1.1277723E+01
184.0	4	+1.1938396E+01	+1.3736476E+00	+1.3057899E+01	+1.0057099E+01	+1.1220333E+01
187.0	4	+1.2960521E+01	+1.2055574E-01	+1.3101399E+01	+1.2812999E+01	+1.1195736E+01
197.0	3	+1.2586730E+01	+4.9011424E-01	+1.3084599E+01	+1.2104699E+01	+1.1113751E+01

STAGE II. DISSECTED MTRS. OUTER, SOL GEL. GEL SWELL RATIO

This sample size summary is applicable to figures 77 thru 81

Y = ((+1.2728882E+01) + (-8.1986329E-03) * X)

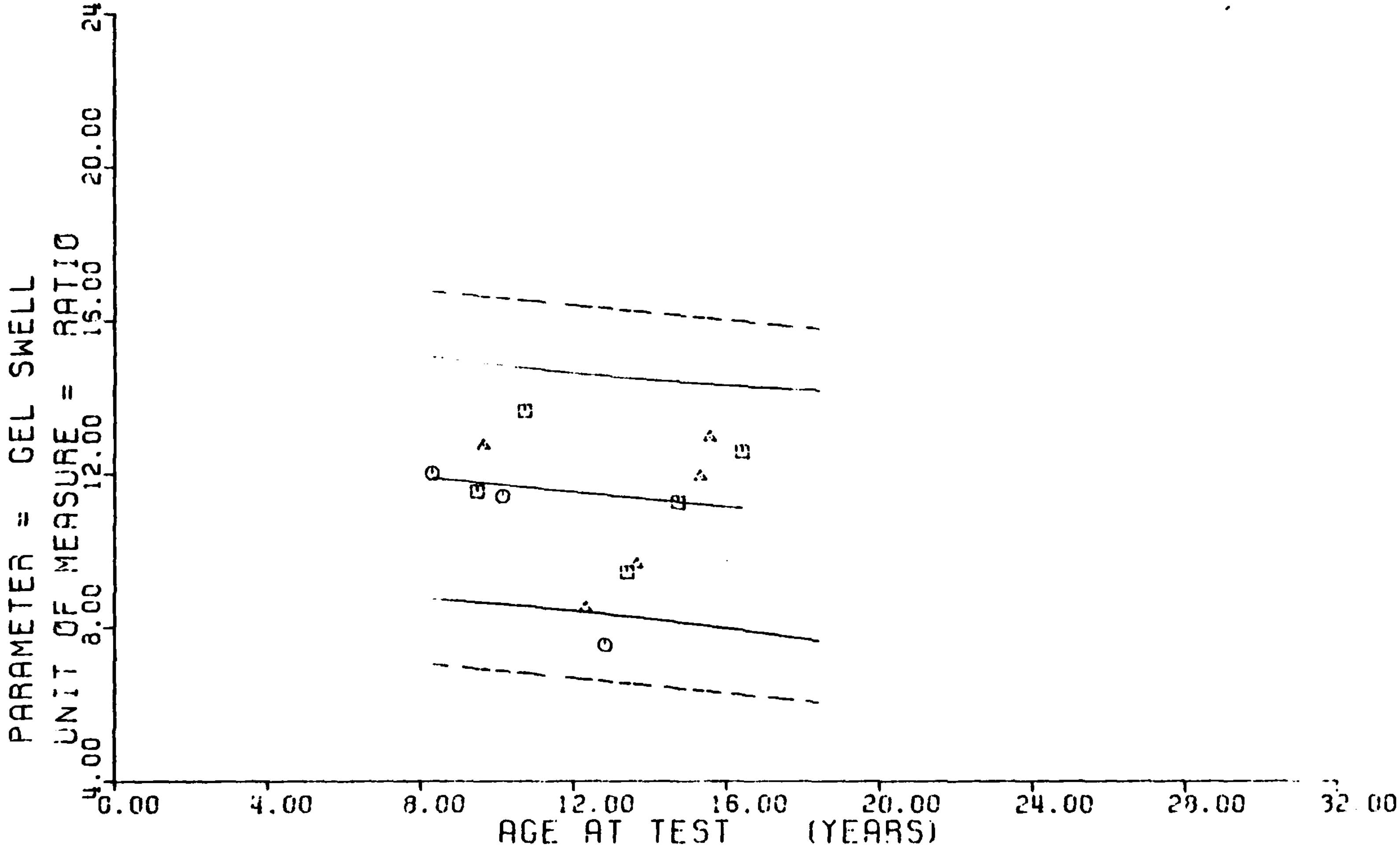
F = +1.3867749E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y = +1.6289535E+00

R = -1.5823405E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT S_β = +6.9620709E-03

t = +1.1776141E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT S_E = +1.6232559E+00

N = 56 DEGREES OF FREEDOM = 54

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



STAGE II, DISSECTED MTRS, OUTER, SOL GEL, GEL SWELL RATIO

Figure 77

Y = ((+3.5081755E+00) + (+5.6981214E-05) × X)

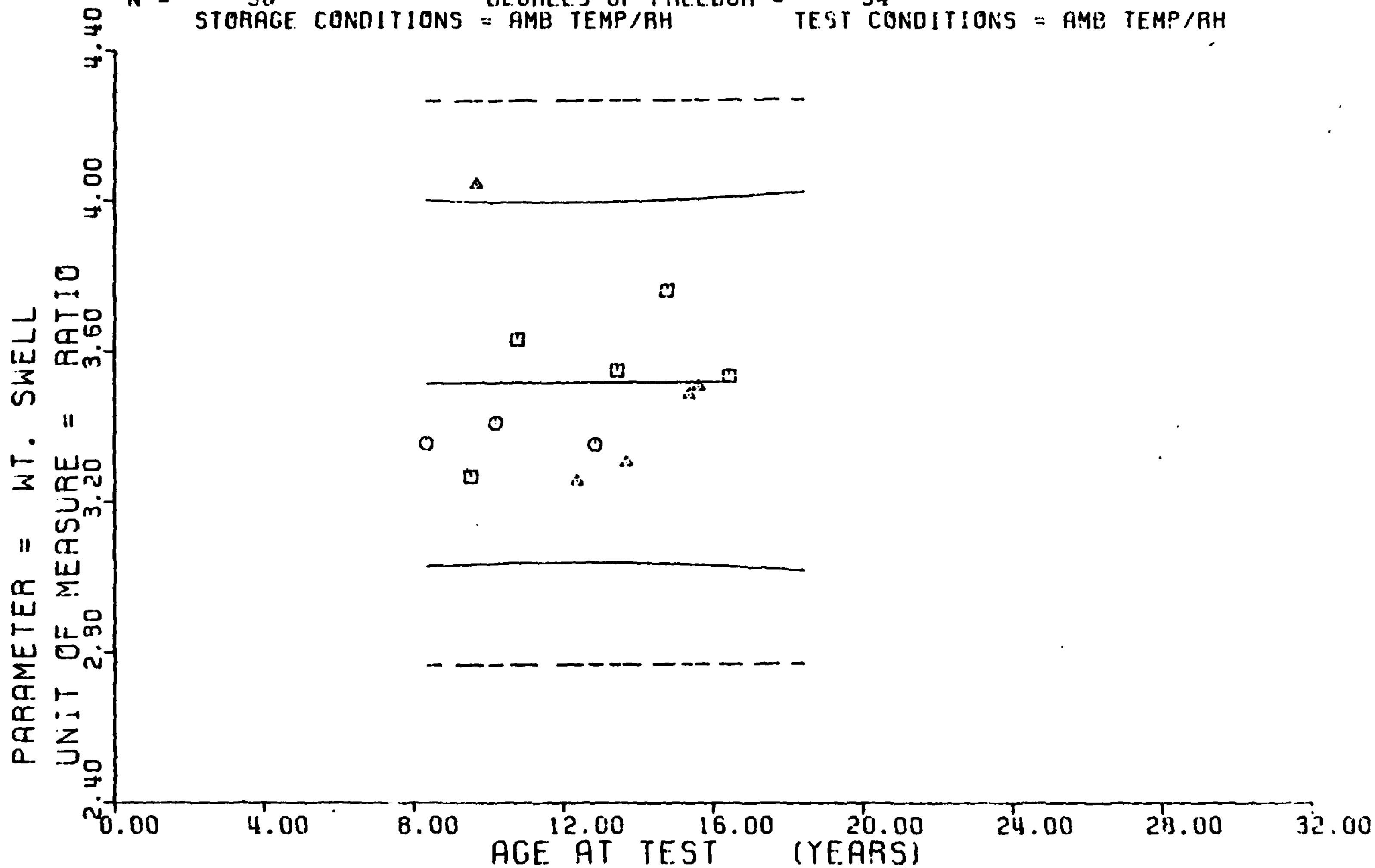
F = +2.8267067E-03 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y = +2.4760920E-01

R = +7.2348933E-03 SIGNIFICANCE OF R = NOT SIGNIFICANT S_a = +1.0717446E-03

ι = +5.3166782E-02 SIGNIFICANCE OF ι = NOT SIGNIFICANT $S_ε$ = +2.4988482E-01

N = 56 DEGREES OF FREEDOM = 54

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



STAGE II, DISSECTED MTRS, OUTER, SOL GEL, WT. SWELL RATIO

Figure 78

Y = ((+1.7708406E+00) + (-1.1552010E-04) * X)

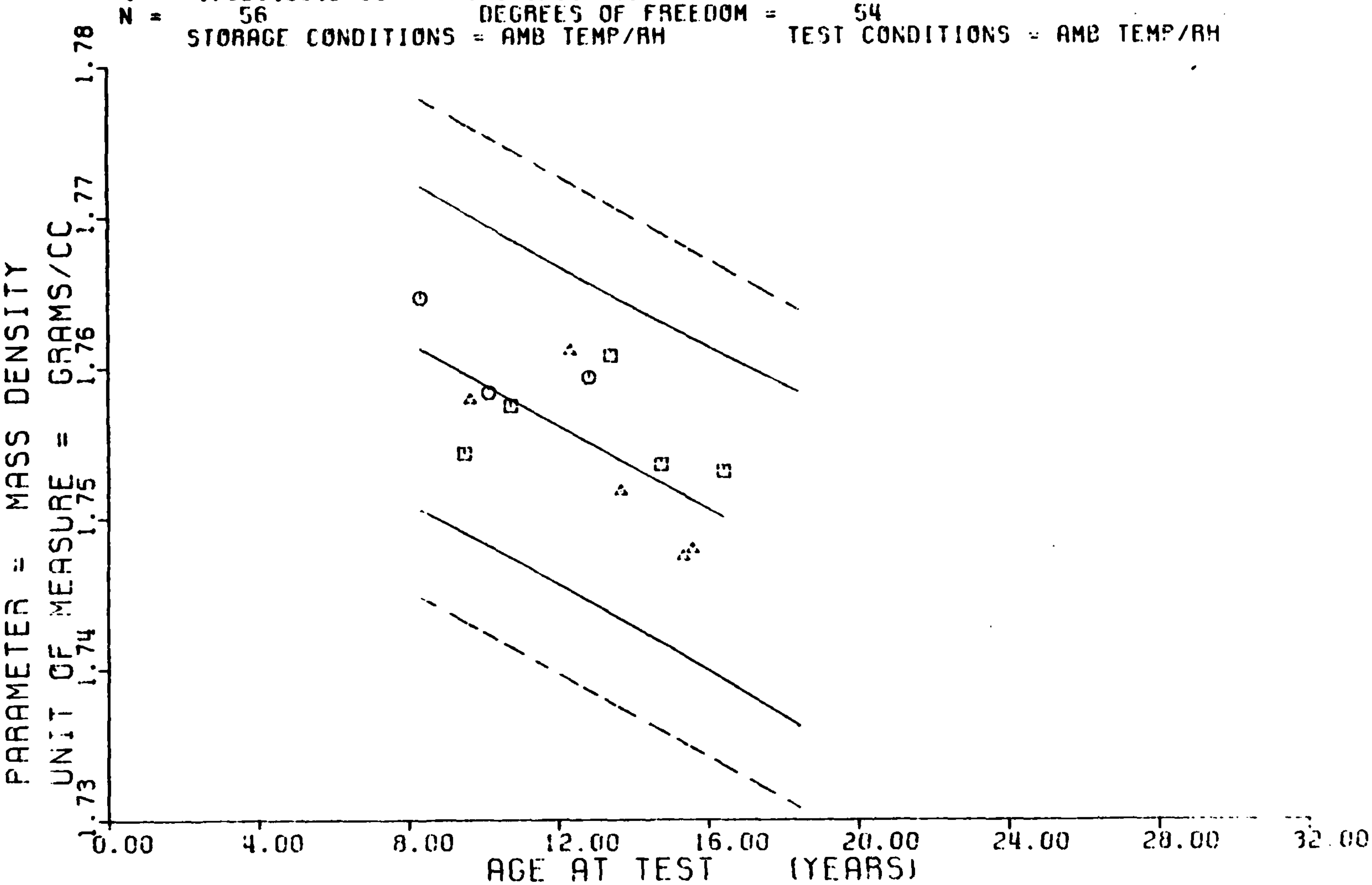
F = +2.3946032E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +6.5524695E-03

R = -5.5426796E-01 SIGNIFICANCE OF R = SIGNIFICANT S_b = +2.3606998E-05

t = +4.8934683E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +5.5041384E-03

N = 56 DEGREES OF FREEDOM = 54

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



STAGE II. DISSECTED MTRS. OUTER. SOL GEL. MASS DENSITY

Figure 79

Y = ((+2.5943149E-02) + (+6.0286468E-05) × X)

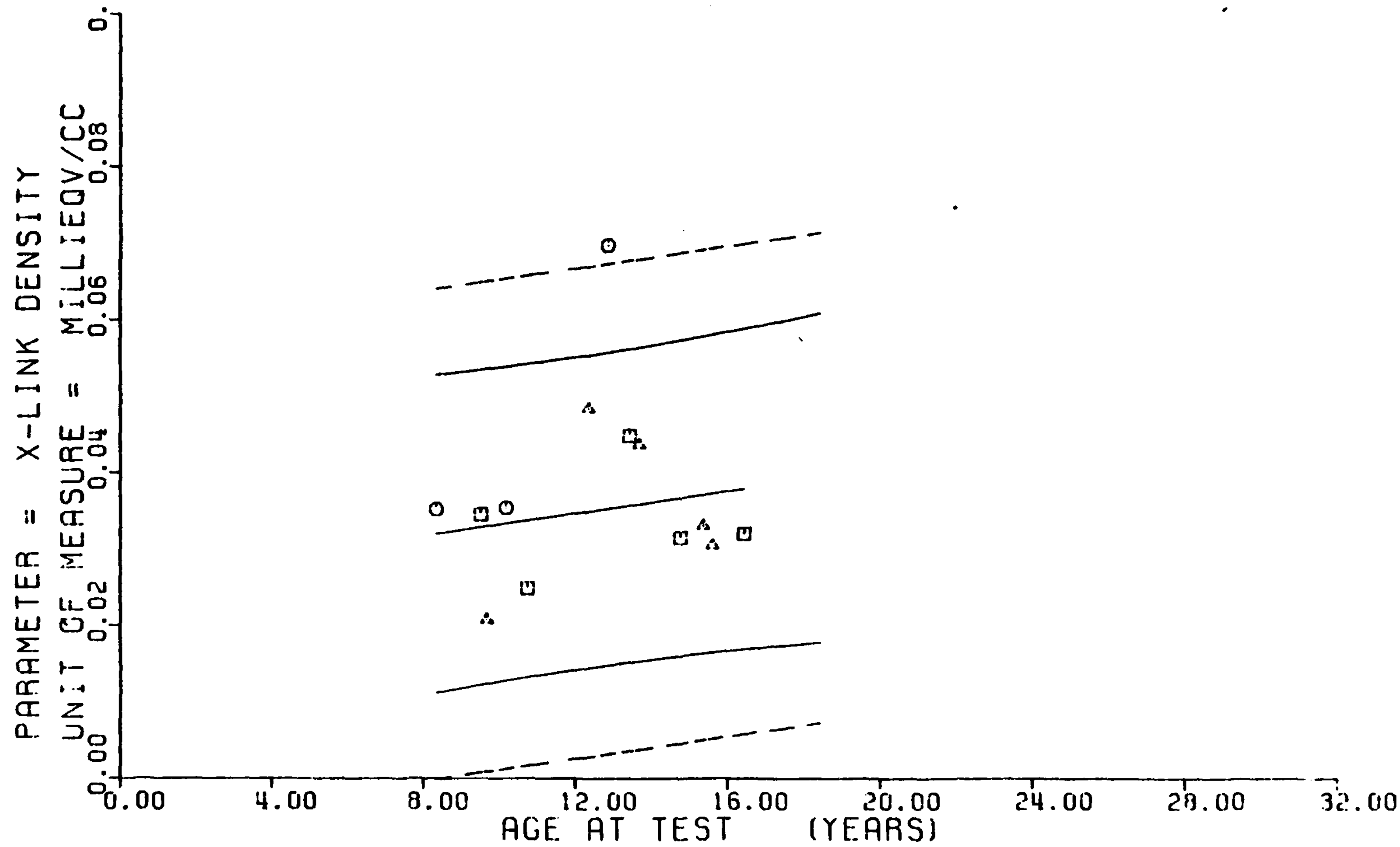
F = +1.7293107E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y = +1.0759507E-02

R = +1.7615408E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT S_B = +4.5844086E-05

t = +1.3150326E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT S_E = +1.0688872E-02

N = 56 DEGREES OF FREEDOM = 54

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



STAGE II, DISSECTED MTRS, OUTER, SOL GEL, CROSS-LINK DENSITY

Figure 80

Y = ((+9.9013762E+00) + (-1.2114227E-02) × X)

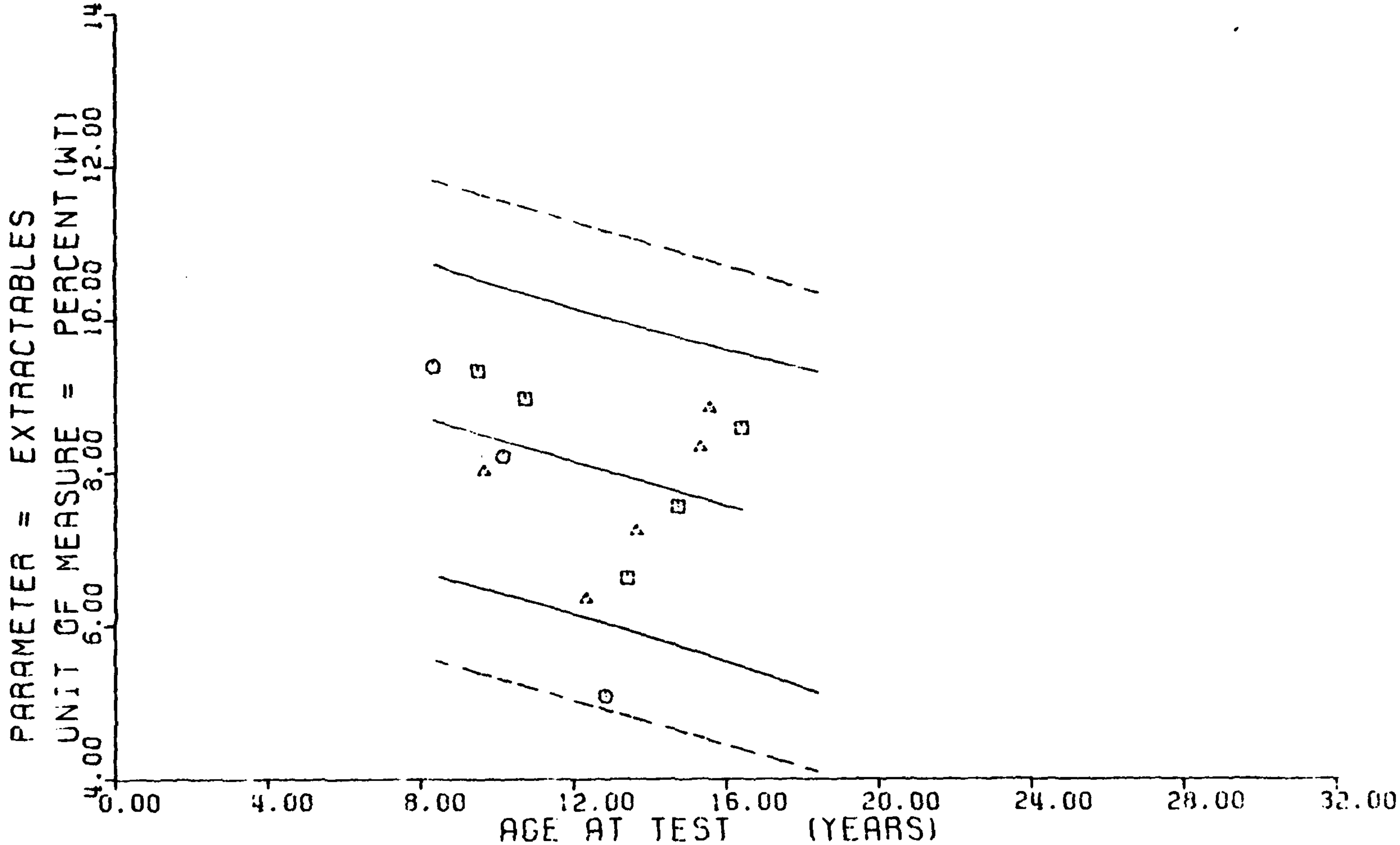
F = +7.3283987E+00 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +1.1017655E+00

R = -3.4567958E-01 SIGNIFICANCE OF R = SIGNIFICANT S_0 = +4.4749807E-03

t = +2.7071015E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +1.0433733E+00

N = 56 DEGREES OF FREEDOM = 54

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



STAGE II. DISSECTED MTRS, OUTER, SOL GEL, EXTRACTABLE

Figure 81

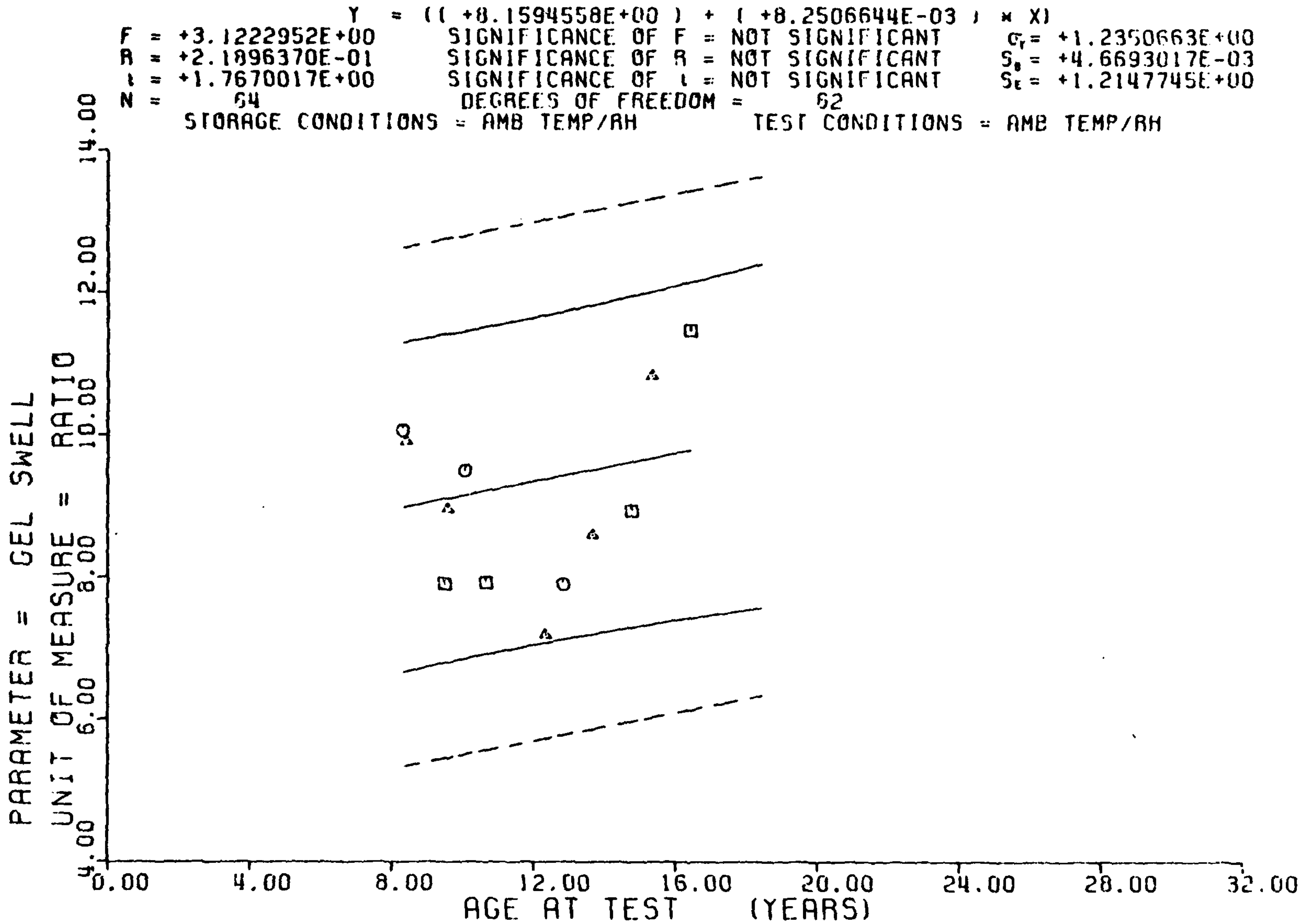
**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
100.0	6	+1.0069294E+01	+7.9053913E-02	+1.0186499E+01	+9.9869995E+00	+8.9845218E+00
101.0	10	+9.9140739E+00	+7.3970410E-01	+1.0729899E+01	+8.9436998E+00	+8.9927721E+00
114.0	5	+7.9080715E+00	+4.3321901E-01	+8.4303998E+00	+7.4035997E+00	+9.1000308E+00
115.0	6	+8.9621095E+00	+1.0073482E+00	+9.4771995E+00	+6.9125995E+00	+9.1082820E+00
121.0	6	+9.5064105E+00	+1.9581838E-01	+9.7871999E+00	+9.2842998E+00	+9.1577854E+00
128.0	6	+7.9226932E+00	+8.7591484E-02	+8.0307998E+00	+7.8123998E+00	+9.2155399E+00
148.0	3	+7.1939640E+00	+3.4742748E-01	+7.4222993E+00	+6.7941999E+00	+9.3805532E+00
154.0	3	+7.9037981E+00	+1.1156578E-01	+8.0190992E+00	+7.7965993E+00	+9.4300575E+00
164.0	4	+8.6018218E+00	+2.6128277E-01	+8.8603992E+00	+8.3646993E+00	+9.5125646E+00
177.0	4	+8.9343910E+00	+3.7133073E-01	+9.2395992E+00	+8.4543991E+00	+9.6198225E+00
184.0	8	+1.0835317E+01	+1.4163789E-01	+1.1072399E+01	+1.0575699E+01	+9.6775779E+00
197.0	3	+1.1465326E+01	+3.1321492E-01	+1.1739999E+01	+1.1124399E+01	+9.7848358E+00

STAGE II. DISSECTED MTRS. INNER. SOL GEL. GEL SWELL RATIO

This sample size summary is applicable to figures 82 thru 86



STAGE II, DISSECTED MTRS, INNER, SOL GEL, GEL SWELL RATIO

Figure 82

Y = ((+3.5782549E+00) + (-1.0118564E-03) * X)

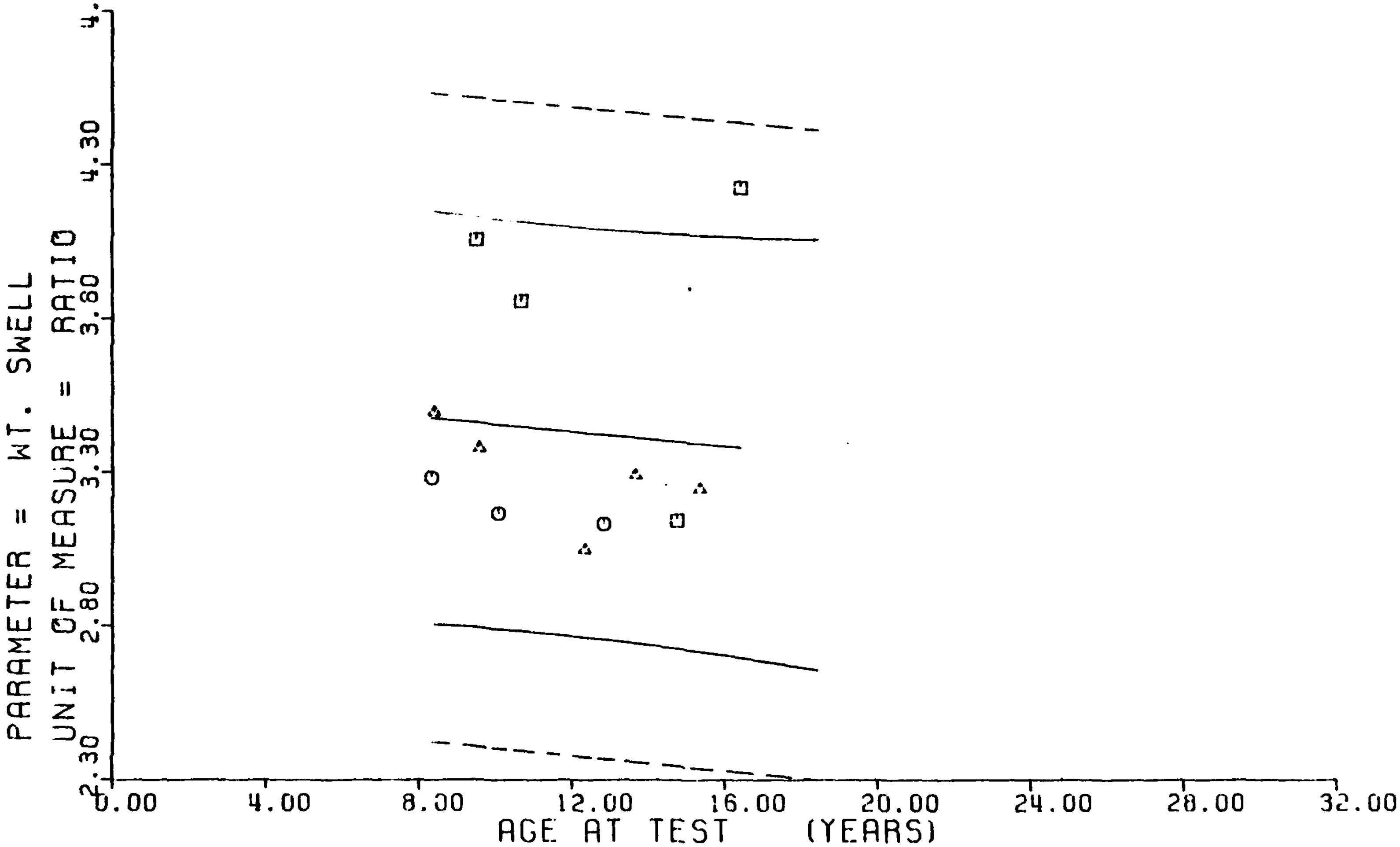
F = +5.5982617E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_r = +3.5060132E-01

R = -9.4597320E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT S_b = +1.3523599E-03

ι = +7.4821532E-01 SIGNIFICANCE OF ι = NOT SIGNIFICANT S_E = +3.5103258E-01

N = 64 DEGREES OF FREEDOM = 62

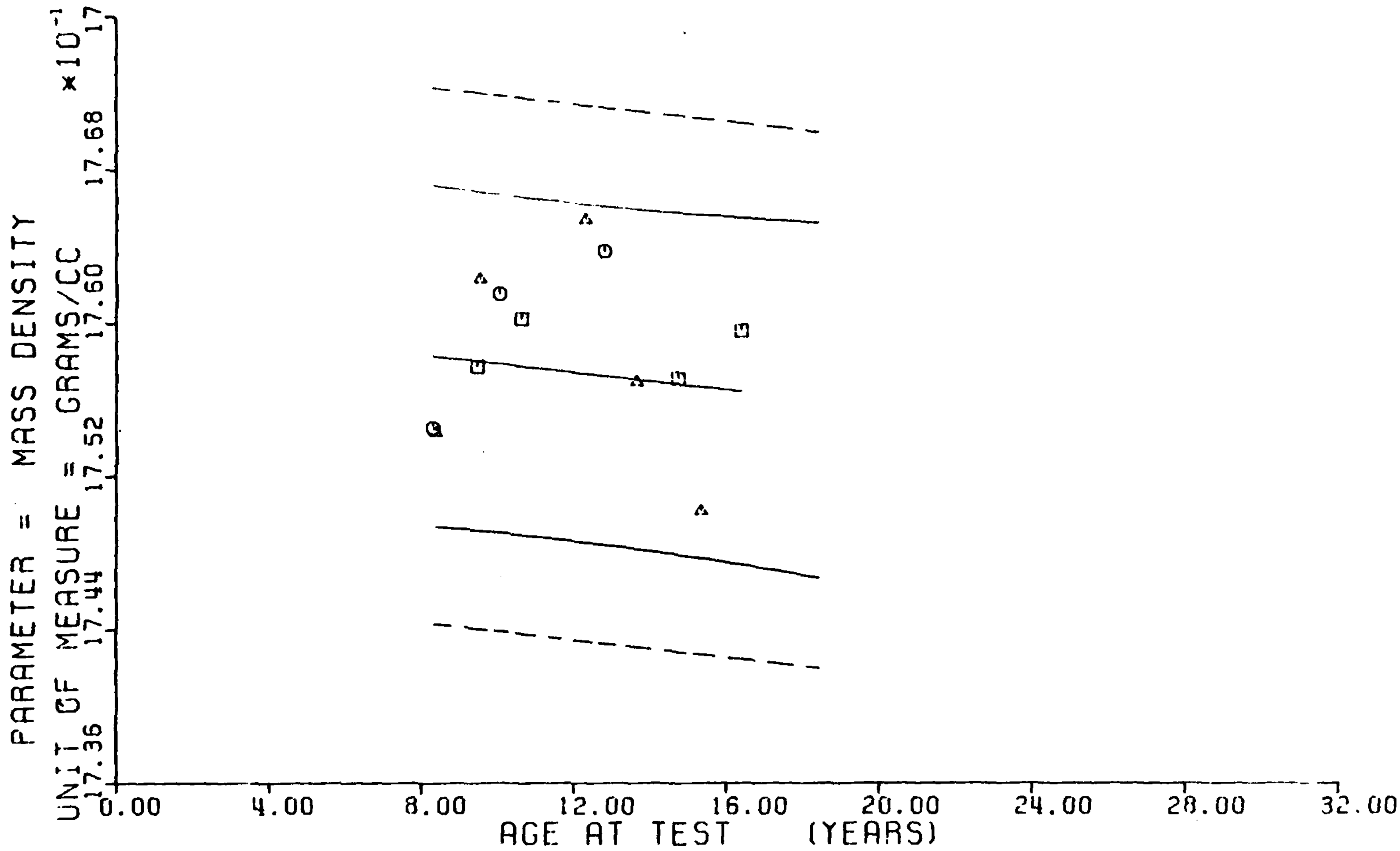
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



STAGE II, DISSECTED MTRS, INNER, SOL GEL, WT. SWELL RATIO

Figure 83

```
          Y   =  (( +1.7602114E+00 )  +  ( -1.9148246E-05 )  × X)
F  =  +1.1404285E+00      SIGNIFICANCE OF F = NOT SIGNIFICANT     σY = +4.6700572E-03
R  =  -1.3439412E-01      SIGNIFICANCE OF R = NOT SIGNIFICANT     SB = +1.7930605E-05
t  =  +1.0679085E+00      SIGNIFICANCE OF t = NOT SIGNIFICANT     SE = +4.6648610E-03
N  =       64               DEGREES OF FREEDOM =     62
     STORAGE CONDITIONS = AMB TEMP/RH         TEST CONDITIONS = AMB TEMP/RH
```



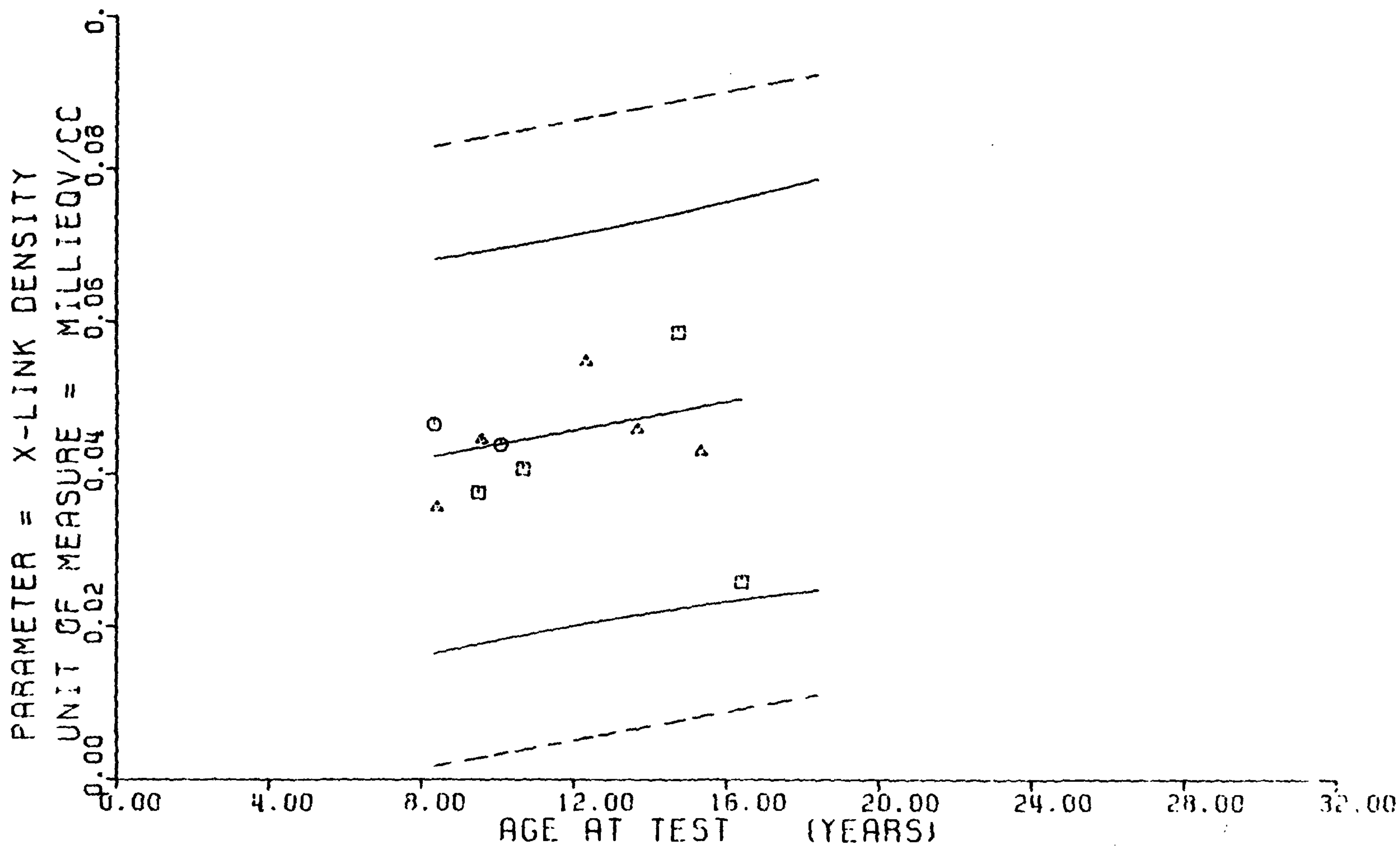
STAGE II, DISSECTED MTRS, INNER, SOL GEL, MASS DENSITY

Figure 84

$Y = ((+3.4571232E-02) + (+7.7535281E-05) \times X)$

F = +2.2177269E+00	SIGNIFICANCE OF F = NOT SIGNIFICANT	σ_Y = +1.3675596E-02
R = +1.8583459E-01	SIGNIFICANCE OF R = NOT SIGNIFICANT	S_b = +5.2064334E-05
t = +1.4892034E+00	SIGNIFICANCE OF t = NOT SIGNIFICANT	S_E = +1.3545314E-02
N = 64	DEGREES OF FREEDOM = 62	

STORAGE CONDITIONS = AMB TEMP/RH   TEST CONDITIONS = AMB TEMP/RH



STAGE II. DISSECTED MTRS, INNER, SOL GEL, CROSS-LINK DENSITY

Figure 85

Y = ((+6.1512352E+00) + (+3.7692243E-03) × X)

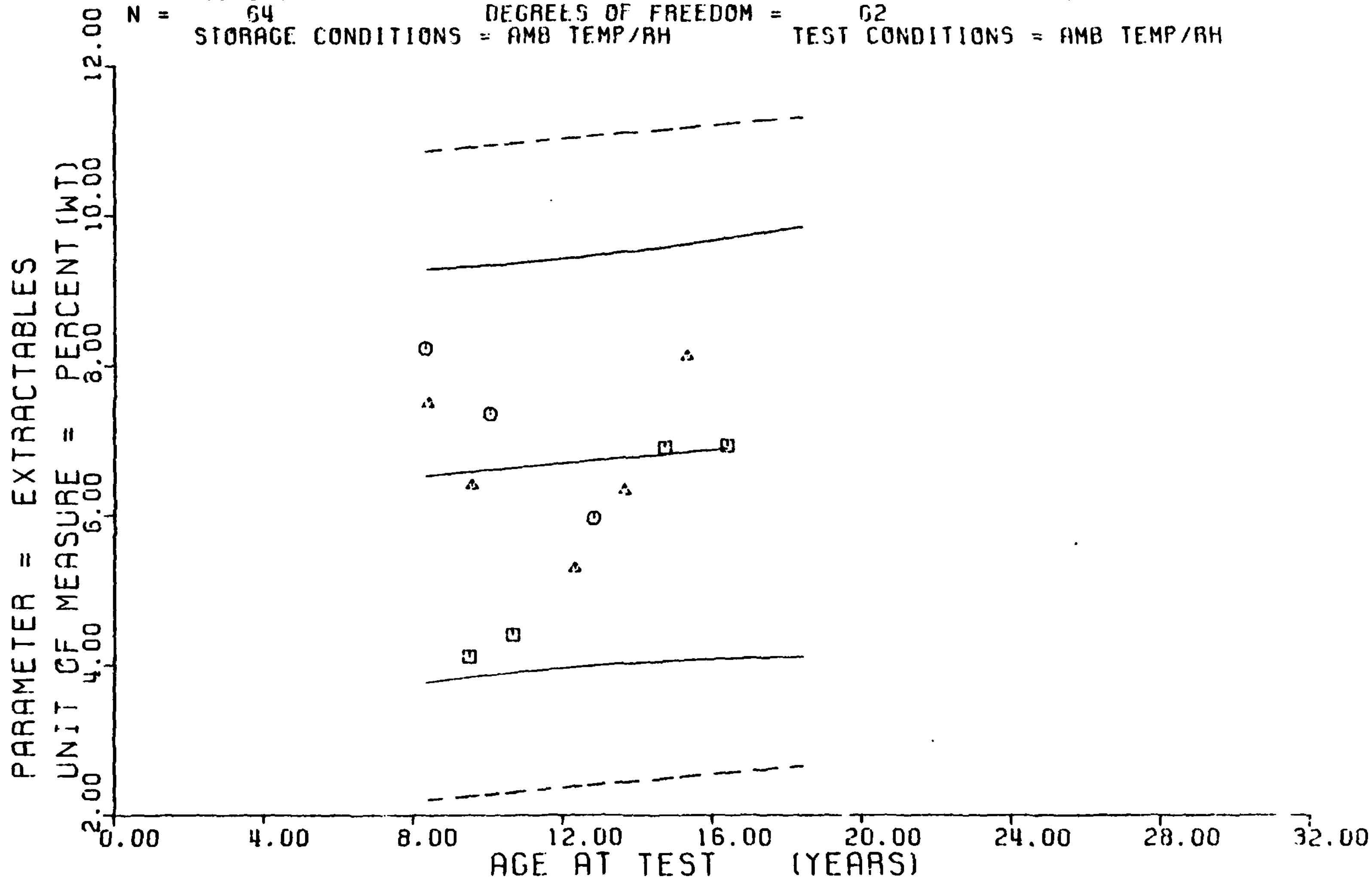
F = +4.6201769E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_T = +1.4364951E+00

R = +8.6004524E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT S_B = +5.5452697E-03

t = +6.7971883E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT S_E = +1.4426681E+00

N = 64 DEGREES OF FREEDOM = 62

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



STAGE II, DISSECTED MTRS, INNER, SOL GEL, EXTRACTABLE

Figure 86

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Dissected Motor Solid Propellant
Minuteman Safeguard

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report contains the data obtained from testing propellant and case bond materials from two dissected Minuteman Stage II motors. The tests conducted were in accordance with Service Engineering (MMWRME) General Test Directive GTD-1 Dissect dated 28 June 1974. The directive specifies the tests required to elucidate any age induced problems which may affect the service life of the Stage II motor.

Linear regression analysis was used to indicate trends of the test parameters. A representative regression plot was made of several parameters with

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Directorate of Maintenance
Hill AFB, UT 84056

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